A2C 4458 73044

SEARCH REQUEST FORM Scientific and Technical Information Center - EIC2800

Rev. 8/27/01 This is an experimental format -- Please give suggestions or comments to Jeff Harrison, CP4-9C18, 306-5429.

Date 08/12/02 Serial # 09/484,259 Priority Application Date 04/14/1998

Your Name TARIFUR Chowdhury Examiner # 74504

AU 2871 Phone 308-4115 Room CP4-7D33

In what format would you like your results? Paper is the default. (PAPER) DISK EMAIL

If ubmitting more than one search, please prioritize in order of need.

The EIC s archer normally will contact you before beginning a prior art search. If you would like to sit with a s archer for an interactive search, please notify one of the searchers.

Where have you searched so far on this case?
Circle: (USPT) (DWPI) (EPO Abs) (JPO Abs) (IBM TDB)

Other: _____

What relevant art have you found so far? Please attach pertinent citations or Information Disclosure Statements. USPAT 4112,157; 5880,801; 5,745,205

What types of references would you like? Please checkmark:

Primary Refs ✓ Nonpatent Literature ✓ Other _____
Secondary Refs ✓ Foreign Patents ✓
Teaching Refs ✓

What is the topic, such as the **novelty**, motivation, utility, or other specific facets defining the desired **focus** of this search? Please include the concepts, synonyms, keywords, acronyms, registry numbers, definitions, structures, strategies, and anything else that helps to describe the topic. Please attach a copy of the abstract and pertinent claims.

* Alignment layer/orientation layer made of smooth Al_2O_3 (aluminum oxide/pentoxide/hydroxide) or Al_2O_3 coating. Plastic substrates; homeotropic/Vertical/Perpendicular alignment/orientation.

Staff Use Only
Searcher: Derrick Blalock
Searcher Phone: _____
Searcher Location: STIC-EIC2800, CP4-9C18
Date Searcher Picked Up: 8/12/02
Date Completed: 8/13/02
Searcher Prep/Rev Time: 270
Online Time: 110

Type of Search
Structure (#) _____
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Fulltext _____
Patent Family _____
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Dialog ✓
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WWW/Internet _____
Other _____

EIC2800
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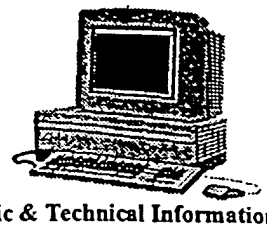

Scientific & Technical Information Center

The search results generated for your recent request are attached. If you have any questions or comments (compliments or complaints) about the scope or the results of the search, please contact *the EIC searcher* who conducted the search *or contact*:

Jeff Harrison, Team Leader, 306-5429

Voluntary Results Feedback Form

- *I am an examiner in Workgroup:* _____ *(Example: 2830)*
- *Relevant prior art found, search results used as follows:*
  - ☐ 102 rejection
  - ☐ 103 rejection
  - ☐ Cited as being of interest.
  - ☐ Helped examiner better understand the invention.
  - ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
  (journal articles, conference proceedings, new product announcements etc.)

- *Relevant prior art **not found**:*
  - ☐ Results verified the lack of relevant prior art (helped determine patentability).
  - ☐ Search results were not useful in determining patentability or understanding the invention

Other Comments:

Drop off completed forms in **CP4-9C18**, or send to **Jeff Harrison, CP4-9C18.**

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Set	Items	Description
S1	5692	CI=(AL SS(S) O SS)(S)NE=2
S2	437627	ALUMINUM()OXIDE OR ALUMINIUM()OXIDE OR AL2O3 OR AL2O2 OR AL2O5 OR AL2O OR ((AL OR ALUMINIUM OR ALUMINUM)(W)(OXIDE OR O)) OR AL(2N)O OR ALUMINA()TRIHYDRATE OR ALOXITE OR ALUMINA OR ALUMINITE OR SAPPHIRE
S3	54529	((ALIGN? OR ORIENTAT?)(5N)(LAYER? OR FILM? ? OR COAT????))
S4	1236468	(PLASTIC? OR THERMOPLASTIC? OR THERMOSET? OR (RESINOUS? OR POLYMER? OR SYNTHETIC?)(2N)(MATERIAL? OR SUBSTANCE? OR MOLD? OR CAST?))
S5	40	S1 AND S3
S6	40	RD (unique items)
S7	2553	S2 AND S3
S8	2533	S7 NOT S6
S9	37	S8 AND S4
S10	22	RD (unique items)
S11	200	S8 AND (HOMEOTROPIC? OR VERTICAL? OR PERPENDICULAR)
S12	137	RD (unique items)
S13	111	S12 AND SUBSTRATE? ?
S14	1	S13 AND ((LIQUID()CRYSTAL? ?) OR LC OR LIQ()CRYSTAL? ?)
S15	110	S13 NOT (S5 OR S9)
S16	105	S1 AND (HOMEOTROPIC? OR VERTICAL? OR PERPENDICULAR)
S17	3	S16 AND S4
S18	3	S17 NOT (S5 OR S9)
S19	25923	((ALIGN? OR ORIENTAT?)(2N)(LAYER? OR FILM? ? OR COAT????))
S20	1170	S2 AND S19
S21	9	S20 AND S4
S22	8	RD (unique items)
S23	0	S22 NOT (S5 OR S9 OR S17)
S24	76	S20 AND (HOMEOTROPIC? OR VERTICAL? OR PERPENDICULAR)
S25	57	RD (unique items)
S26	54	S25 NOT (S5 OR S9 OR S17 OR S22)
S27	49	S26 NOT PD>=20000119

Subfile: A B

5/3,AB/8 (Item 8 from file: 2)
DIALOG(R)File 2:INSPEC

6816189 INSPEC Abstract Number: A2001-04-6820-017, B2001-02-2520E-005
Title: Surface characterization of transparent conductive oxide Al-doped ZnO films
Author(s): Chen, M.; Pei, Z.L.; Sun, C.; Wen, L.S.; Wang, X.
Author Affiliation: Inst. of Metall., Acad. Sinica, Shanghai, China
Journal: Journal of Crystal Growth vol.220, no.3 p.254-62
Publisher: Elsevier,
Publication Date: Dec. 2000 Country of Publication: Netherlands
CODEN: JCRGAE ISSN: 0022-0248
SICI: 0022-0248(200012)220:3L.254:SCTC;1-5
Material Identity Number: J037-2001-001
U.S. Copyright Clearance Center Code: 0022-0248/2000/$20.00
Language: English
Abstract: High preferred (002) **orientation** Al-doped ZnO (ZAO) **films** were prepared by DC magnetron reactive sputtering from a Zn target mixed with Al of 2.0 wt%. The dependence of spatial distributions of resistivity on the substrate temperature indicates that the spatial distribution of resistivity across the substrate placed parallel to the target was improved by increasing substrate temperature. XPS analysis indicates Al-enrichment on the film surface.
Subfile: A B

5/3,AB/9 (Item 9 from file: 2)
DIALOG(R)File 2:INSPEC

6809633 INSPEC Abstract Number: A2001-04-8115H-005, B2001-02-0520F-062
Title: Epitaxial growth of InN films on MgAl/sub 2/O/sub 4/ (111) substrates
Author(s): Tsuchiya, T.; Miki, O.; Shimada, K.; Ohnishi, M.; Wakahara, A. ; Yoshida, A.
Author Affiliation: Dept. of Electr. & Electron. Eng., Toyohashi Univ. of Technol., Japan
Journal: Journal of Crystal Growth vol.220, no.3 p.185-90
Publisher: Elsevier,
Publication Date: Dec. 2000 Country of Publication: Netherlands
CODEN: JCRGAE ISSN: 0022-0248
SICI: 0022-0248(200012)220:3L.185:EGFM;1-Z
Material Identity Number: J037-2001-001
U.S. Copyright Clearance Center Code: 0022-0248/2000/$20.00
Language: English
Abstract: Epitaxial InN layers were deposited on MgAl/sub 2/O/sub 4/ (111) substrates by microwave-excited metalorganic vapor-phase epitaxy. The crystallographic **orientation** relationships between the InN **layer** and MgAl/sub 2/O/sub 4/ (111) were InN (00.1) MgAl/sub 2/O/sub 4/ (111) and InN[11.0] MgAl/sub 2/O/sub 4/ [100]. The full-width at half-maximum of the X-ray rocking curve of 97 arcsec was obtained on MgAl/sub 2/O/sub 4/ (111
Subfile: A B

5/3,AB/10 (Item 10 from file: 2)
DIALOG(R)File 2:INSPEC

6767134 INSPEC Abstract Number: A2001-01-8115L-009, B2001-01-0520J-003
Title: Preparation of Al- and Li-doped ZnO thin films by sol-gel method
Author(s): Fujihara, S.; Sasaki, C.; Kimura, T.
Author Affiliation: Dept. of Appl. Chem., Keio Univ., Yokohama, Japan
Journal: Key Engineering Materials Conference Title: Key Eng. Mater. (Switzerland) vol.180-182 p.109-12
Publisher: Trans Tech Publications,
Publication Date: 2000 Country of Publication: Switzerland
CODEN: KEMAEY ISSN: 1013-9826
SICI: 1013-9826(2000)180/182L.109:PDTF;1-L
Material Identity Number: K935-2000-004
Conference Title: Electroceramics in Japan III. 19th Electronics Division Meeting of the Ceramic Society of Japan
Conference Date: Oct. 1999 Conference Location: Kawasaki, Japan
Language: English
Abstract: Conducting Al-doped ZnO and insulating Li-doped ZnO thin films were prepared by the sol-gel method. All the **films** exhibited c-axis-**orientation** perpendicular to substrates. The crystallite size of ZnO monotonically decreased with increasing the dopant concentration. Doping 1 mol% of Al in the ZnO film minimized the sheet resistance on the order of 0.5 M Omega Square Operator /sup -1/. The conducting behavior of the Li-doped ZnO film was found to depend greatly on the heat-treatment temperature. The current density of 3*10/sup -6/ and 1*10/sup -3/ Acm/sup -2/ at an applied voltage of 5 V was observed for the 10 mol% Li-doped ZnO films heat-treated at 500 and 600 degrees C, respectively.
Subfile: A B

5/3,AB/11 (Item 11 from file: 2)
DIALOG(R)File 2:INSPEC

6647136 INSPEC Abstract Number: A2000-16-8115C-020, B2000-08-0520B-024
Title: Preparation of transparent conducting ZnO:Al films on polymer substrates by r.f. magnetron sputtering
Author(s): Zhang, D.H.; Yang, T.L.; Ma, J.; Wang, Q.P.; Gao, R.W.; Ma, H.L.
Author Affiliation: Dept. of Phys., Shandong Univ., Jinan, China
Journal: Applied Surface Science vol.158, no.1-2 p.43-8
Publisher: Elsevier,
Publication Date: May 2000 Country of Publication: Netherlands
CODEN: ASUSEE ISSN: 0169-4332
SICI: 0169-4332(200005)158:1/2L.43:PTCF;1-3
Material Identity Number: I974-2000-009
U.S. Copyright Clearance Center Code: 0169-4332/2000/$20.00
Language: English
Abstract: Highly transparent conducting Al-doped ZnO films with good adherence and low resistivity have been prepared on polymer substrates by r.f. magnetron sputtering. Mechanically stable polycrystalline conducting ZnO:Al **films** having a preferred **orientation** with the (002) planes parallel to the substrates were deposited on polyisocyanate (PI)

substrate with resistivities in the range of 4.1*10/sup -3/ to 5.110/sup -4/ Omega cm, with carrier densities more than 2.6*10/sup 20/ cm/sup -3/ and Hall mobilities between 5.78 and 13.11 cm/sup 2/ V/sup -1/ s/sup -1/. The average transmittance exceeded 80% for a 440 nm thick film deposited on polypropylene adipate (PPA) substrate in the visible spectrum. The quality of obtained films depended on substrate temperatures, sputtering power, Ar pressures and compositions of used targets during film fabrication.
Subfile: A B

5/3,AB/12 (Item 12 from file: 2)
DIALOG(R)File 2:INSPEC

6596530 INSPEC Abstract Number: A2000-12-8160B-103
Title: Pit initiation in AlO/sub x//Al thin films
Author(s): Son, K.-A.; Barbour, J.C.; Missert, N.; Wall, F.D.; Copeland, R.G.; Martinez, M.A.; Minor, K.G.; Buchheit, R.G.; Isaacs, H.S.
Author Affiliation: Sandia Nat. Labs., Albuquerque, NM, USA
Conference Title: Proceedings of the Symposium on Critical Factors in Localized Corrosion III. Symposium in Honor of the 70th Birthday of Jerome Kruger p.673-7
Editor(s): Kelly, R.G.; Frankel, G.S.; Natishan, P.M.; Newman, R.C.
Publisher: Electrochem. Soc, Pennington, NJ, USA
Publication Date: 1999 Country of Publication: USA xxiii+725 pp.
ISBN: 1 56677 211 7 Material Identity Number: XX-1999-02019
Conference Title: Proceedings of the Symposium on Critical Factors in Localized Corrosion III. Symposium in Honor of the 70th Birthday of Jerome Kruger
Conference Date: 1-6 Nov. 1998 Conference Location: Boston, MA, USA
Language: English
Abstract: The electrochemical responses of AlO/sub x//Al thin films have been investigated as a function of film growth conditions which produce **films** with different grain **orientation**, size and morphology. **Films** with smooth, 150 nm diameter, randomly oriented grains show a higher pitting potential and lower passive current than those films with large grain-boundary grooving from a mixture of smooth micron-sized, (200)-oriented grains and 300-500 nm diameter, (220)-oriented grains. These results suggest that surface roughness from grain-boundary grooving affects the pitting resistance more strongly than does the grain boundary density.
Subfile: A

5/3,AB/13 (Item 13 from file: 2)
DIALOG(R)File 2:INSPEC

6570504 INSPEC Abstract Number: A2000-11-8120N-005
Title: Design of Si/sub 3/N/sub 4/ based layered composites for multifunctional application
Author(s): Lences, Z.; Sajgalik, P.; Roncari, E.; Hirao, K.
Author Affiliation: Inst. of Inorg. Chem., Slovak Acad. of Sci., Bratislava, Slovakia
Journal: Key Engineering Materials Conference Title: Key Eng. Mater. (Switzerland) vol.175-176 p.173-82
Publisher: Trans Tech Publications,
Publication Date: 2000 Country of Publication: Switzerland

CODEN: KEMAEY ISSN: 1013-9826
SICI: 1013-9826(2000)175/176L.173:DSBL;1-O
Material Identity Number: K935-2000-001
Conference Title: Engineering Ceramics '99: Multifunctional Properties - New Perspectives. Advanced Research Workshop on Engineering Ceramics
Conference Date: 11-15 May 1999 Conference Location: Smolenice Castle, Slovakia
Language: English
Abstract: Multifunctional Si/sub 3/N/sub 4//(beta -SiAlON+TiN) layered composites were prepared from tape casted sheets by in situ reactions and subsequent hot pressing. The bending strength and fracture toughness of layered materials measured in direction normal to the layer interface were substantially greater (1184 MPa and 9.75 MPa.m/sup 1/2/) in comparison to the bulk beta -SiAlON+TiN composite (647 MPa and 4.71 MPa.m/sup 1/2/). High anisotropy was achieved for the electrical resistance of the layered materials in parallel (6.10/sup -2/ Omega cm) and perpendicular (5.10/sup 11/ Omega cm) direction to the **layer alignment**.
Subfile: A

5/3,AB/14 (Item 14 from file: 2)
DIALOG(R)File 2:INSPEC

6551069 INSPEC Abstract Number: A2000-09-6180J-020
Title: Formation of ZnAl/sub 2/O/sub 4/ and MgAl/sub 2/O/sub 4/ spinel in Al/sub 2/O/sub 3/ by ion implantation
Author(s): White, C.W.; Meldrum, A.; Sonder, E.; Budai, J.D.; Zuhr, R.A.; Withrow, S.P.; Henderson, D.O.
Author Affiliation: Oak Ridge Nat. Lab., TN, USA
Conference Title: Microstructural Processes in Irradiated Materials. Symposium p.219-24
Editor(s): Zinkle, S.J.; Lucas, G.E.; Ewing, R.C.; Williams, J.S.
Publisher: Mater. Res. Soc, Warrendale, PA, USA
Publication Date: 1999 Country of Publication: USA xvi+735 pp.
ISBN: 1 55899 446 7 Material Identity Number: XX-1999-01921
Conference Title: Microstructural Processes in Irradiated Materials. Symposium
Conference Date: 30 Nov.-2 Dec. 1998 Conference Location: Boston, MA, USA
Language: English
Abstract: ZnAl/sub 2/O/sub 4/ spinel has been formed in Al/sub 2/O/sub 3/ by ion implantation. Sequential implantation of Zn and O in overlapping profiles followed by annealing in Ar+H/sub 2/ gives rise to a nearly continuous epitaxial layer of ZnAl/sub 2/O/sub 4/ oriented with (111) planes parallel to (0001) planes of Al/sub 2/O/sub 3/. If only Zn is implanted, then discrete bands of ZnAl/sub 2/O/sub 4/ oriented with (422) planes parallel to (0001) planes of Al/sub 2/O/sub 3/ are produced. By similar methods, oriented MgAl/sub 2/O/sub 4/ spinel also has been produced in Al/sub 2/O/sub 3/ by sequential Mg+O implantation.
Subfile: A

5/3,AB/15 (Item 15 from file: 2)
DIALOG(R)File 2:INSPEC

6401991 INSPEC Abstract Number: A1999-24-6460-003, B1999-12-0520F-087
Title: GaN nucleation mechanism on a surface template of oxidized AlAs
Author(s): Kobayashi, N.P.; Kobayashi, J.T.; Won-Jin Choi; Dapkus, P.D.
Author Affiliation: Compound Semicond. Lab., Univ. of Southern California, Los Angeles, CA, USA
Conference Title: Wide-Bandgap Semiconductors for High Power, High Frequency and High Temperature. Symposium p.47-52
Editor(s): DenBaars, S.; Palmour, J.; Shur, M.; Spencer, M.
Publisher: Mater. Res. Soc, Warrendale, PA, USA
Publication Date: 1998 Country of Publication: USA xiii+565 pp.
ISBN: 1 55899 418 1 Material Identity Number: XX-1998-02831
Conference Title: Wide-Bandgap Semiconductors for High Power, High Frequency and High Temperature. Symposium
Conference Date: 13-15 April 1998 Conference Location: San Francisco, CA, USA
Language: English
Abstract: The surfaces of oxidized AlAs(AlO/sub x/) layers on Si(111) substrates are studied to understand the mechanism by which single crystal alpha -GaN can be grown by metalorganic chemical vapor deposition (MOCVD) on AlO/sub x/, that appears to be an amorphous/fine-grain phase. Contact mode atomic force microscopy (C-AFM) and reflection high energy electron diffraction (RHEED) are used to study the AlO/sub x/, surface on which a GaN nucleation layer (GaN NL) is grown. The results indicate that an oriented alpha -Ga/sub 2/O/sub 3/ layer is formed on AlO/sub x/, which is covered by a GaAs cap layer during oxidation. We infer that the alpha -Ga/sub 2/O/sub 3/ acts as a surface template that provides the order necessary for the subsequent growth of single crystal alpha -GaN. Characterization using RHEED and selective area electron diffraction (SAD) in cross sectional transmission microscopy (XTEM) reveals that the in-plane crystallographic orientation has a unique **alignment** between the various **layers** -GaN, a-Ga/sub 2/O/sub 3/ and the Si substrate. This in-plane alignment is understood by considering the atomic arrangement of each material on the plane perpendicular to [111]/sub Si/ at each interface. Moreover a comparison is made between alpha -GaN grown on alpha -Ga/sub 2/O/sub 3/ and on alpha -Al/sub 2/O/sub 3/(0001) to characterize structural defects in alpha -GaN. The formation of specific structural defects, a large number of planar defects run perpendicular to [111]/sub Si/ in alpha -GaN/ alpha -Ga/sub 2/O/sub 3/ is discussed in conjunction with GaN-NL on alpha -Ga/sub 2/O/sub 3/.
Subfile: A B

5/3,AB/16 (Item 16 from file: 2)
DIALOG(R)File 2:INSPEC

6297397 INSPEC Abstract Number: A1999-16-8115R-009, B1999-08-0520X-019
Title: Transparent semiconducting ZnO:Al thin films prepared by spray pyrolysis
Author(s): Seeber, W.T.; Abou-Helal, M.O.; Barth, S.; Beil, D.; Hoche, T. ; Afify, H.H.; Demian, S.E.
Author Affiliation: Otto-Schott-Inst., Friedrich-Schiller-Univ., Jena, Germany
Journal: Materials Science in Semiconductor Processing vol.2, no.1 p.45-55
Publisher: Elsevier,
Publication Date: 1999 Country of Publication: UK
CODEN: MSSPFQ ISSN: 1369-8001

SICI: 1369-8001(1999)2:1L.45:TSTF;1-O
Material Identity Number: H070-1999-002
U.S. Copyright Clearance Center Code: 1369-8001/99/$20.00
Language: English
Abstract: Aluminum doped zinc oxide (ZnO:Al) films which can be used as transparent electrodes or heating layers have been deposited by the low cost spray pyrolysis technique. Undoped and Al-doped ZnO films deposited using various preparation conditions and on different substrates (soda lime glass, quartz glass and crystalline quartz, respectively) have been studied. The effect of substrate type, temperature, deposition time and doping concentration on ZnO:Al thin layers have been investigated by analysing the optical and structural properties of the films. A substrate temperature of 770 K allows the preparation of nanosized ZnO:Al crystals with preferred [002] **orientation**. **Films** with optical transmission T>85% and a adjustable resistivity rho between 2 and 100 Omega cm have been obtained. The resistivity value of the films can be adjusted by tuning suitable processing parameters. The feasibility of the spray pyrolysis technique for the preparation of thin semiconducting ZnO:Al films on conventional soda lime glass substrates is demonstrated.
Subfile: A B

5/3,AB/17 (Item 17 from file: 2)
DIALOG(R)File 2:INSPEC

6046197 INSPEC Abstract Number: A9822-6855-053
Title: Transparent conducting ZnO:Al films deposited on organic substrates deposited by r.f. magnetron-sputtering
Author(s): Yang, T.L.; Zhang, D.H.; Ma, J.; Ma, H.L.; Chen, Y.
Author Affiliation: Inst. of Opto-Electron. Mater. & Devices, Shandong Univ., China
Journal: Thin Solid Films vol.326, no.1-2 p.60-2
Publisher: Elsevier,
Publication Date: 4 Aug. 1998 Country of Publication: Switzerland
CODEN: THSFAP ISSN: 0040-6090
SICI: 0040-6090(19980804)326:1/2L.60:TCFD;1-I
Material Identity Number: T070-98019
U.S. Copyright Clearance Center Code: 0040-6090/98/$19.00
Language: English
Abstract: Transparent conducting ZnO:Al films with good adhesion and low resistivity have been prepared on organic substrates by r.f. magnetron-sputtering. Polycrystalline ZnO:Al **films** having a preferred **orientation** were obtained with resistivity 1.84*10/sup -3/ Omega cm, carrier concentration 4.62*10/sup 20/ cm/sup -3/ and Hall mobility 7.34 cm/sup 2//v per s. The average transmittance of the films is 84% in the wavelength range of the visible spectrum.
Subfile: A

5/3,AB/18 (Item 18 from file: 2)
DIALOG(R)File 2:INSPEC

5995475 INSPEC Abstract Number: A9818-8120L-026
Title: Sol-gel preparation of transparent and conductive aluminum-doped zinc oxide **films** with highly preferential crystal **orientation**

Author(s): Ohyama, M.; Kozuka, H.; Yoko, T.
Author Affiliation: Intellectual Property Centre, Idemitsu Kosan Co. Ltd., Chiba, Japan
Journal: Journal of the American Ceramic Society vol.81, no.6 p. 1622-32
Publisher: American Ceramic Soc,
Publication Date: June 1998 Country of Publication: USA
CODEN: JACTAW ISSN: 0002-7820
SICI: 0002-7820(199806)81:6L.1622:PTCA;1-Z
Material Identity Number: J107-98007
U.S. Copyright Clearance Center Code: 0002-7820/98/$5.00+0.50
Language: English
Abstract: Transparent aluminum-doped zinc oxide (ZnO) films were prepared via the sol-gel method on silica-glass substrates from 2-methoxyethanol solutions of zinc acetate and aluminum chloride that contained monoethanolamine. Dip coating was conducted at room temperature, with substrate withdrawal rates of 1.2-7.0 cm/min. After each deposition, the films were heat-treated in air at 200-450 degrees C for 10 min (pre-heat-treatment). After six to fourteen layers had been deposited, the films were then subjected to annealing in air at 500-800 degrees C for 1 h (the first post-heat-treatment), followed by annealing in nitrogen at 500-700 degrees C for 15 min to 4 h (the second post-heat-treatment). All the films obtained ,were transparent and showed only an extremely sharp ZnO (002) peak in the X-ray diffractometry (XRD) patterns. The effects of the aluminum content, the substrate withdrawal speed, and the heat-treatment conditions on the electrical resistivity of the films were studied. All these factors strongly affected the resistivity. The lowest resistivity value (6.5*10/sup -3/ Omega .cm) was achieved in a film that contained 0.5 at,% aluminum, prepared with a low substrate withdrawal speed (1.2 cm/min), and a pre-heat-treatment of individual layer at 400 degrees C in air and a post-heat-treatment of the entire film at 600 degrees C in air, followed by a post-heat-treatment at 600 degrees C in nitrogen.
Subfile: A

5/3,AB/19 (Item 19 from file: 2)
DIALOG(R)File 2:INSPEC

5951980 INSPEC Abstract Number: A9815-6855-050, B9808-8420-012
Title: XRD analysis of ZnO thin films prepared by spray pyrolysis
Author(s): van Heerden, J.L.; Swanepoel, R.
Author Affiliation: Dept. of Phys., Rand Afrikaans Univ., Johannesburg, South Africa
Journal: Thin Solid Films vol.299, no.1-2 p.72-7
Publisher: Elsevier,
Publication Date: 15 May 1997 Country of Publication: Switzerland
CODEN: THSFAP ISSN: 0040-6090
SICI: 0040-6090(19970515)299:1/2L.72:ATFP;1-Y
Material Identity Number: T070-97016
U.S. Copyright Clearance Center Code: 0040-6090/97/$17.00
Language: English
Abstract: Undoped and aluminium-doped ZnO thin films were prepared on glass substrates by spray pyrolysis. The variation in the structural properties with a variation in the zinc acetate concentration in the precursor solution, substrate temperature, as well as the doping concentration, were investigated by means of X-ray diffraction (XRD). The films were found to be polycrystalline, with the (002) orientation being

preferential in most of the **films**. It is clear that the **orientation** of the crystallites, depends largely on the deposition parameters of the films. It was further found that post deposition annealing under various conditions had no large effect on the structures of the films investigated.
Subfile: A B

5/3,AB/20 (Item 20 from file: 2)
DIALOG(R)File 2:INSPEC

5785670 INSPEC Abstract Number: A9803-6855-031
Title: The physical properties of Al-doped zinc oxide films prepared by RF magnetron sputtering
Author(s): Park, K.C.; Ma, D.Y.; Kim, K.H.
Author Affiliation: Dept. of Electron. Mater. Eng., Gyeongsang Nat. Univ., Chinju, South Korea
Journal: Thin Solid Films vol.305, no.1-2 p.201-9
Publisher: Elsevier,
Publication Date: 15 Aug. 1997 Country of Publication: Switzerland
CODEN: THSFAP ISSN: 0040-6090
SICI: 0040-6090(19970815)305:1/2L.201:PPDZ;1-7
Material Identity Number: T070-97020
U.S. Copyright Clearance Center Code: 0040-6090/97/$17.00
Language: English
Abstract: Al-doped zinc oxide (AZO) films are prepared by RF magnetron sputtering on glass and Si substrates with specifically designed ZnO targets containing different amounts of Al/sub 2/O/sub 3/ powder as a doping source. The physical properties of the AZO films are investigated in terms of the preparation conditions, such as Al/sub 2/O/sub 3/ content in the target, RF power (P/sub RF/), substrate temperature (T/sub s/) and working pressure (P/sub w/). The crystal structure of the AZO film is hexagonal wurtzite, and all the **films** show the typical crystallographic **orientation** , with the c-axis perpendicular to the substrate. The growth rate increases with increasing P/sub RF/, but decreases with increasing T/sub s/ and P/sub w/. Films 1500 AA thick with the lowest resistivity (rho) of 4.7*10/sup -4/ Omega cm and the transmittance over 90% at the visible region are prepared by using nominal 3 wt.% Al/sub 2/O/sub 3/ target at T/sub s/=150 degrees C, P/sub w/=2 mTorr and P/sub RF/=150 W. Optical transmittance measurements show that AZO films are degenerate semiconductors with direct bandgap. The optical energy bandgap for undoped ZnO film is ~3.3 eV and those for AZO films increase as the carrier concentration (n/sub e/) in the film increases. The blue shift in the AZO films is proportional to one third power of n/sub e/.
Subfile: A

5/3,AB/21 (Item 21 from file: 2)
DIALOG(R)File 2:INSPEC

5618397 INSPEC Abstract Number: A9715-6855-037, B9708-2520D-019
Title: Structural, electrical and optical properties of aluminum doped zinc oxide films prepared by radio frequency magnetron sputtering
Author(s): Kun Ho Kim; Ki Cheol Park; Dae Young Ma
Author Affiliation: Dept. of Phys., Gyeongsang Nat. Univ., Chinju, South

Korea
Journal: Journal of Applied Physics vol.81, no.12 p.7764-72
Publisher: AIP,
Publication Date: 15 June 1997 Country of Publication: USA
CODEN: JAPIAU ISSN: 0021-8979
SICI: 0021-8979(19970615)81:12L.7764:SEOP;1-7
Material Identity Number: J004-97011
U.S. Copyright Clearance Center Code: 0021-8979/97/81(12)/7764/9/$10.00
Language: English
Abstract: Aluminum doped zinc oxide (AZO) films are prepared by rf magnetron sputtering on glass or Si substrates using specifically designed ZnO targets containing different amount of Al/sub 2/O/sub 3/ powder as the Al doping source. The structural, electrical, and optical properties of the AZO films are investigated in terms of the preparation conditions, such as the Al/sub 2/O/sub 3/ content in the target, rf power, substrate temperature and working pressure. The crystal structure of the AZO **films** is hexagonal wurtzite. The **orientation**, regardless of the Al content, is along the c axis perpendicular to the substrate. The doping concentration in the film is 1.9 at.% for 1 wt% Al/sub 2/O/sub 3/ target, 4.0 at.% for 3 wt% Al/sub 2/O/sub 3/ target, and 6.2 at.% for 5 wt% Al/sub 2/O/sub 3/ target. The resistivity of the AZO film prepared with the 3 wt% Al/sub 2/O/sub 3/ target is ~4.7*10/sup -4/ Omega cm, and depends mainly on the carrier concentration. The optical transmittance of a 1500-AA-thick film at 550 nm is ~90%. The optical band gap depends on the Al doping level and on the microstructure of the films, and is in the range of 3.46-3.54 eV. The optical band gap widening is proportional to the one-third power of the carrier concentration.
Subfile: A B

5/3,AB/22 (Item 22 from file: 2)
DIALOG(R)File 2:INSPEC

5589448 INSPEC Abstract Number: A9713-6822-012
Title: Reactive coating of dolomite on alumina substrates
Author(s): de Aza, A.H.; Pena, P.; Moya, J.S.
Author Affiliation: Inst. de Ceramica y Vidrio, CSIC, Madrid, Spain
Journal: Journal of the European Ceramic Society vol.17, no.7 p. 935-41
Publisher: Elsevier,
Publication Date: 1997 Country of Publication: UK
CODEN: JECSER ISSN: 0955-2219
SICI: 0955-2219(1997)17:7L.935:RCDA;1-U
Material Identity Number: N568-97006
U.S. Copyright Clearance Center Code: 0955-2219/97/$17.00
Language: English
Abstract: The feasibility of using reactive coating of dolomite to obtain an oriented CaAl/sub 12/O/sub 19/ (hibonite) coating on alumina substrates has been shown. The textured hibonite grains grow oriented along the [110] direction on the alumina substrate. By using single crystal of sapphire it has been proved that the **orientation** of the hibonite **layer** is not dependent upon the crystal orientation of the alumina substrate. Alumina-alumina sandwiches with a weak interface have been prepared using this reactive coating technique.
Subfile: A

5/3,AB/23 (Item 23 from file: 2)
DIALOG(R)File 2:INSPEC

5473923 INSPEC Abstract Number: A9704-7360F-014, B9702-2520D-060
Title: Manipulating the electrical and optical properties of polycrystalline ZnO based thin films
Author(s): Srikant, V.; Clarke, D.R.
Author Affiliation: Dept. of Mater., California Univ., Santa Barbara, CA, USA
Journal: Diffusion and Defect Data Part B (Solid State Phenomena)
Conference Title: Diffus. Defect Data B, Solid State Phenom. (Switzerland)
vol.51-52 p.579-84
Publisher: Balaban Publishers; Scitec Publications,
Publication Date: 1996 Country of Publication: Switzerland
CODEN: DDBPE8 ISSN: 1012-0394
SICI: 1012-0394(1996)51/52L.579:MEOP;1-P
Material Identity Number: B404-96002
Conference Title: Polycrystalline Semiconductors IV - Physics, Chemistry and Technology - Fourth International Conference
Conference Sponsor: Acad. Nat. Lincei; Consiglio Nat. Res., Gruppo Nat. Struttura della Materia; et al
Conference Date: 9-14 Sept. 1995 Conference Location: Gargnano, Italy
Language: English
Abstract: The electrical and optical properties of polycrystalline ZnO thin films depend on their grain size and the biaxial residual strain as well as on their doping. The former two can be altered independently of the doping level by the choice of the substrates on which the films are grown. On sapphire substrates, the electron mobility of the ZnO films show a transition from polycrystalline to "single-crystal" behavior at Al-doping concentrations of ~2*10/sup 19//cm/sup 3/ irrespective of the substrate crystallographic **orientation**. The band edge of ZnO **films** grown on fused silica substrates shows a shift to lower energies contrary to that expected from deformation potential considerations only. Finally, it is observed that by sandwiching a thin layer of Bi/sub 2/O/sub 3/ between two layers of Al doped ZnO and annealing in air to create grain boundary traps leads to a heterostructure having varistor properties. These thin film varistors are found to have a switching voltage of 0.11 eV per grain, a lower value than in bulk ZnO varistors.
Subfile: A B

5/3,AB/24 (Item 24 from file: 2)
DIALOG(R)File 2:INSPEC

5473917 INSPEC Abstract Number: A9704-6855-084, B9702-0520F-086
Title: Relations between texture and electrical parameters of thin polycrystalline zinc oxide films
Author(s): Ellmer, K.; Diesner, K.; Wendt, R.; Fiechter, S.
Author Affiliation: Solare Energetik, Hahn-Meitner-Inst., Berlin, Germany
Journal: Diffusion and Defect Data Part B (Solid State Phenomena)
Conference Title: Diffus. Defect Data B, Solid State Phenom. (Switzerland)
vol.51-52 p.541-6
Publisher: Balaban Publishers; Scitec Publications,
Publication Date: 1996 Country of Publication: Switzerland
CODEN: DDBPE8 ISSN: 1012-0394

SICI: 1012-0394(1996)51/52L.541:RBTE;1-#
Material Identity Number: B404-96002
Conference Title: Polycrystalline Semiconductors IV - Physics, Chemistry and Technology - Fourth International Conference
Conference Sponsor: Acad. Nat. Lincei; Consiglio Nat. Res., Gruppo Nat. Struttura della Materia; et al
Conference Date: 9-14 Sept. 1995 Conference Location: Gargnano, Italy
Language: English
Abstract: Aluminium doped zinc oxide (ZnO:Al) films, deposited by sputtering methods, are widely used as transparent conducting electrodes, especially for window and contact layers in heterojunction thin film solar cells. In this paper the influence of the discharge parameters (excitation mode, target material, oxygen partial pressure) on the texture of the ZnO-films is studied. XRD-texture measurements of aluminium doped ZnO-films prepared by reactive magnetron sputtering by DC and RF excitation show a strong influence of the discharge conditions (especially the oxygen partial pressure) on the preferential **orientation** and the strain in the **films** . This structural information can be related to the electrical properties of the ZnO-layers. Films with the lowest resistivities and the highest mobilities show the largest grains (d/sub g/ approximately=40 nm) and narrow texture distributions around the c-axis. For RF-sputtered films from a metallic target the half width of the texture distribution is as low as chi /sub 1/2/=4.5 degrees . DC-sputtering from a Zn:Al-target increases the half width to chi /sub 1/2/=6.8 degrees . These findings lead to a better understanding of the resistance minima which have been observed for reactive magnetron sputtering of ZnO or ZnO:Al as a function of the oxygen partial pressure. The electrical properties of Al-doped ZnO-films are caused by bulk and not surface properties.
Subfile: A B

5/3,AB/25 (Item 25 from file: 2)
DIALOG(R)File 2:INSPEC

5468789 INSPEC Abstract Number: A9704-8115C-002, B9702-0510D-102
Title: Heteroepitaxial growth of TiO/sub 2/ films by ion-beam sputter deposition
Author(s): Morris Hotsenpiller, P.A.; Wilson, G.A.; Roshko, A.; Rothman, J.B.; Rohrer, G.S.
Author Affiliation: Exp., Du Pont de Nemours (E.I.) & Co., Wilmington, DE, USA
Journal: Journal of Crystal Growth Conference Title: J. Cryst. Growth (Netherlands) vol.166, no.1-4 p.779-85
Publisher: Elsevier,
Publication Date: 2 Sept. 1996 Country of Publication: Netherlands
CODEN: JCRGAE ISSN: 0022-0248
SICI: 0022-0248(19960902)166:1/4L.779:HGTF;1-C
Material Identity Number: J037-96019
U.S. Copyright Clearance Center Code: 0022-0248/96/$15.00
Conference Title: Eleventh International Conference on Crystal Growth
Conference Date: 18-23 June 1995 Conference Location: The Hague, Netherlands
Language: English
Abstract: Heteroepitaxial TiO/sub 2/ films of the rutile and anatase phases have been grown using the ion-beam sputter deposition technique. The **orientations** of the highest-quality rutile **films** grown and their corresponding substrates are (100)/(0001)Al/sub 2/O/sub 3/,

(101)//(1120)Al/sub 2/O/sub 3/, (001)//(1010)Al/sub 2/O/sub 3/, and (110)//(110)MgO. This is the first report of the heteroepitaxial growth of (001)//(1010)Al/sub 2/O/sub 3/ and (110)//(110)MgO rutile films. Results indicate that the **films** are **aligned** both perpendicular and parallel to the plane of the film. Distinct surface morphologies are observed for each orientation. The (100) and (101) rutile orientations were also grown on (111)MgO and (1102)Al/sub 2/O/sub 3/, respectively. The (100) anatase grew on both (100)MgO and MgAl/sub 2/O/sub 4/. The growth mechanisms of several rutile films on Al/sub 2/O/sub 3/ substrates were investigated, and the data suggest island or Volmer-Weber type growth.

Subfile: A B

5/3,AB/26 (Item 26 from file: 2)
DIALOG(R)File 2:INSPEC

5450922 INSPEC Abstract Number: A9702-8115N-001

Title: TEM investigations of spinel-forming solid state reactions: reaction mechanism, **film orientation**, and interface structure during MgAl/sub 2/O/sub 4/ formation on MgO (001) and Al/sub 2/O/sub 3/ (11.2) single crystal substrates

Author(s): Sieber, H.; Hesse, D.; Pan, X.; Senz, S.; Heydenreich, J.

Author Affiliation: Max-Planck-Inst. fuer Mikrostrukturphysik, Halle, Germany

Journal: Zeitschrift fur Anorganische und Allgemeine Chemie vol.622, no.10 p.1658-66

Publisher: Huthig-Johann Ambrosius Barth Verlag,

Publication Date: Oct. 1996 Country of Publication: Germany

CODEN: ZAACAB ISSN: 0044-2313

SICI: 0044-2313(199610)622:10L.1658:ISFS;1-S

Material Identity Number: Z027-96012

Language: English

Abstract: The formation of well-oriented MgAl/sub 2/O/sub 4/ spinel films by solid state reactions between (i) a MgO (001) substrate and an Al/sub 2/O/sub 3/ vapour and (ii) a sapphire (1 1.2) substrate and a deposited solid MgO film, respectively, is experimentally investigated. Composition, structure and morphology of the films are characterized by XRD, SEM, TEM/SAED, and EDX. The reaction fronts involved are investigated by cross-sectional atomic resolution transmission electron microscopy (ARM). The direction of the overall diffusion flux and the kind of diffusing species are determined in experiments using inert markers of sub-micron size. There are common features and, however, distinct differences between cases (i) and (ii). On MgO (001) substrates, the MgAl/sub 2/O/sub 4/ films grow in a simple cube-to-cube orientation: MgAl/sub 2/O/sub 4/(001) MgO(001); MgAl/sub 2/O/sub 4/[100] MgO[100]. The films consist of small grains about 25 to 50 nm in diameter, the orientation of which is symmetrically distributed around the exact orientation, with maximum deviations of about +or-2 degrees . On sapphire (1 1.2) substrates the MgAl/sub 2/O/sub 4/ **films** grow almost in the **orientation** MgAl/sub 2/O/sub 4/(001) Al/sub 2/O/sub 3/(1 1.2); MgAl/sub 2/O/sub 4/[010] Al/sub 2/O/sub 3/[11.0]. These films consist of larger grains about 100 nm in diameter, the orientation of which systematically deviates from the above orientation by unidirectional rotations up to 5 to 6 degrees around the substrate [11.0] axis. The structures of the reaction fronts show corresponding differences, which are discussed in terms of different mechanisms occurring at the initial stage of the spinel-forming reaction because of the different crystallographic conditions at the beginning of

the reactions
Subfile: A

5/3,AB/27 (Item 27 from file: 2)
DIALOG(R)File 2:INSPEC

5390631 INSPEC Abstract Number: A9622-6855-043
Title: c-axis **orientation** of AlN **films** prepared by ECR PECVD
Author(s): Soh, J.W.; Jang, S.S.; Jeong, I.S.; Lee, W.J.
Author Affiliation: Dept. of Mater. Sci. & Eng., Korea Adv. Inst. of Sci. & Technol., Taejon, South Korea
Journal: Thin Solid Films vol.279, no.1-2 p.17-22
Publisher: Elsevier,
Publication Date: June 1996 Country of Publication: Switzerland
CODEN: THSFAP ISSN: 0040-6090
SICI: 0040-6090(199606)279:1/2L.17:AOFP;1-B
Material Identity Number: T070-96015
Language: English
Abstract: AlN films were deposited on silicon substrates at low temperatures (300-500 degrees C) by electron cyclotron resonance plasma-enhanced chemical vapor deposition (ECR PECVD) using trimethylaluminum, N/sub 2/ and H/sub 2/ gases. The degree of c-axis orientation, crystallinity, functional groups and chemical composition of the films were investigated for various deposition conditions. The degree of c-axis orientation depends on the substrate surface condition and it improves with increasing substrate temperature as well as with increasing microwave power. A c-axis oriented (sigma =4.3 degrees) AlN film was prepared at 500 degrees C. The importance of the system design which allows the precursor to be dissociated efficiently by the ECR plasma is discussed.
Subfile: A

5/3,AB/28 (Item 28 from file: 2)
DIALOG(R)File 2:INSPEC

5323609 INSPEC Abstract Number: A9616-8115I-011
Title: Sputtered and reactively grown epitaxial GdAlO/sub 3/ films as buffer layers for C-oriented YBa/sub 2/Cu/sub 3/O/sub 7- delta / films on R-Sapphire
Author(s): Senz, S.; Sieber, H.; Zakharov, N.D.; Lorenz, M.; Hochmuth, H. ; Hesse, D.
Author Affiliation: Max-Planck Inst. fur Mikrostrukturphys., Halle, Germany
Conference Title: Epitaxial Oxide Thin Films II. Symposium p.357-62
Editor(s): Speck, J.S.; Fork, D.K.; Wolf, R.M.; Shiosaki, T.
Publisher: Mater. Res. Soc, Pittsburgh, PA, USA
Publication Date: 1996 Country of Publication: USA xv+562 pp.
Material Identity Number: XX96-01510
Conference Title: Epitaxial Oxide Thin Films II. Symposium
Conference Date: 26-30 Nov. 1995 Conference Location: Boston, MA, USA
Language: English
Abstract: Thin films of the orthorhombic perovskite GdAlO/sub 3/ were grown on R-plane sapphire single crystals. Two different film growth methods were used, viz, (i) a chemical reaction of a Gd-O plasma with the

sapphire crystals, and (ii) the reactive radio frequency (RF) sputtering of a GdAlO/sub 3/ target. Subsequently, YBa/sub 2/Cu/sub 3/O/sub 7- delta / (YBCO) films were deposited onto the GdAlO/sub 3/ buffer by pulsed laser deposition (PLD). The GdAlO/sub 3/ and YBCO films were investigated by X-ray diffraction pole figure analysis and transmission electron microscopy (TEM), including high-resolution transmission electron microscopy of cross sections. Independent of the deposition method the GdAlO/sub 3/ films grew according to the nearly equivalent orientation relationships (110)/sub perovskite/ (11.2)/sub sapphire/; [111] or [111]/sub perovskite/ [11.0]/sub sapphire/ and (002)/sub perovskite/ (11.2)/sub sapphire/;[100] or [010]/sub perovskite/ [11.0]/sub sapphire/. The GdAlO/sub 3/ grains are additionally tilted by angles up to +or-3 degrees around the sapphire [11.1] axis. On top of these buffer layers the YBCO **films** grew with c-**orientation** and with an in-plane rotation of 45 degrees . YBCO films of 200 nm thickness on GdAlO/sub 3/ buffer layers with a thickness of 10 to 20 nm showed a T/sub c/>87 K and a j/sub c/(77 K)*3*10/sup 6/ A/cm/sup 2/.

Subfile: A

5/3,AB/29 (Item 29 from file: 2)

DIALOG(R)File 2:INSPEC

5293915 INSPEC Abstract Number: A9614-8115C-014, B9607-0520F-110

Title: Deposition of doped and undoped ZnO thin films for gas sensors

Author(s): Penza, M.; Martucci, C.; Anisimkin, V.I.; Vasanelli, L.

Author Affiliation: PASTIS-CNRSM, Brindisi, Italy

Journal: Materials Science Forum Conference Title: Mater. Sci. Forum (Switzerland) vol.203 p.137-42

Publisher: Trans Tech Publications,

Publication Date: 1996 Country of Publication: Switzerland

CODEN: MSFOEP ISSN: 0255-5476

SICI: 0255-5476(1996)203L.137:DDUT;1-9

Material Identity Number: H866-96009

Conference Title: Advances in Crystal Growth. Meeting `Italian Crystal Growth`

Conference Date: 15-19 March 1995 Conference Location: Brindisi, Italy

Language: English

Abstract: ZnO thin films have been deposited onto a (100)Si substrate by using rf planar magnetron sputtering. ZnO:Al films have also been prepared by co-sputtering by means of two distinct rf sources, matched to Al and ZnO targets, respectively. The structural and morphological properties have been investigated in order to optimize the film growth for gas sensor applications. It is shown that the polycrystalline **films** exhibit strong c-axis **orientation**. The full width at half maximum (FWHM) of X-ray rocking curve of (002) plane is obtained less than 2.60 degrees . ZnO films are almost stoichiometric, while the content of Al in doped ZnO films is measured as 1/3 at. %. The X-ray photoelectron spectroscopy (XPS) depth profile reveals a uniform stoichiometric ratio along the growth axis. The crystallite grain size of the films, measured by scanning electron microscope (SEM), is in the range 100/130 nm. The thin films show good piezoelectric properties and ZnO-on-Si layered structures have been used to implement surface acoustic wave (SAW) delay lines. ZnO:Al layers have been tested as sensitive elements of calorimetric gas sensors based on SAW delay line as thermal probe. Transient responses of ZnO:Al SAW calorimetric sensor towards O/sub 2/ are reported.

Subfile: A B

5/3,AB/30 (Item 30 from file: 2)
DIALOG(R)File 2:INSPEC

5065817 INSPEC Abstract Number: A9521-8115I-012, B9511-0520F-050
Title: Preparation of crystalline beta barium borate (beta -BaB/sub 2/O/sub 4/) thin films by pulsed laser deposition
Author(s): Xiao, R.-F.; Ng, L.C.; Yu, P.; Wong, G.K.L.
Author Affiliation: Dept. of Phys., Hong Kong Univ. of Sci & Technol., Kowloon, Hong Kong
Journal: Applied Physics Letters vol.67, no.3 p.305-7
Publication Date: 17 July 1995 Country of Publication: USA
CODEN: APPLAB ISSN: 0003-6951
U.S. Copyright Clearance Center Code: 0003-6951/95/67(3)/305/3/$6.00
Language: English
Abstract: Crystalline beta barium borate (beta -BaB/sub 2/O/sub 4/) thin films have been prepared on silicon (001) and sapphire (001) substrates by the pulsed laser deposition technique. The crystallinity of these films was found to depend sensitively on the deposition temperature. At a deposition temperature around 800 degrees C and in the presence of 75 mTorr of O/sub 2/ gas, films grown on Si(100) substrates are typically polycrystalline with X-ray diffraction peaks along (104) and (001) **orientations** while the **film** grown on a sapphire (001) substrate is highly textured with (001) **orientation** (c axis) normal to the **film** surface. The film grown on sapphire (001) substrate exhibits a maximum effective second harmonic generation coefficient d/sub eff/ of 2.2 pm/V, which is comparable to that of bulk beta -BaB/sub 2/O/sub 4/ single crystals.
Subfile: A B

5/3,AB/31 (Item 31 from file: 2)
DIALOG(R)File 2:INSPEC

5054263 INSPEC Abstract Number: A9520-7360F-029
Title: Epitaxial aluminum-doped zinc oxide thin films on sapphire. II. Defect equilibria and electrical properties
Author(s): Srikant, V.; Sergo, V.; Clarke, D.R.
Author Affiliation: Dept. of Mater., California Univ., Santa Barbara, CA, USA
Journal: Journal of the American Ceramic Society vol.78, no.7 p. 1935-9
Publication Date: July 1995 Country of Publication: USA
CODEN: JACTAW ISSN: 0002-7820
U.S. Copyright Clearance Center Code: 0002-7820/95/$5.00+.50
Language: English
Abstract: The electrical transport properties of epitaxial ZnO **films** grown on different **orientations** of sapphire substrates have been measured as a function of partial pressure of oxygen. After equilibration, the carrier concentration is found to change from a p(O/sub 2))/sup -1/4/ to a p(O/sub 2))/sup -3/8/ dependence with increasing oxygen partial pressure. The partial pressure dependence is shown to be consistent with zinc vacancies being the rate-controlling diffusive species. In addition, the carrier concentration in ZnO films grown on A-, C-, and M-plane sapphire are the same but that of R-plane sapphire is

systematically lower. Electron Hall mobility measurements as a function of carrier concentration for all the substrate orientations exhibit a transition from "single-crystal" behavior at high carrier concentrations to "polycrystalline" behavior at low carrier concentrations. This behavior is attributed to the effective height of potential barriers formed at the low-angle grain boundaries in the epitaxial ZnO films. The trap density at the grain boundaries is deduced to be approximately 7*10/sup 12//cm/sup 2/. The electron mobility, at constant carrier concentration, varies With the substrate **orientation** on which the ZnO **films** were grown. The difference is attributed to the difference in dislocation density in the films produced as a result of lattice mismatch with the different sapphire orientations.
Subfile: A

5/3,AB/32 (Item 32 from file: 2)
DIALOG(R)File 2:INSPEC

5020846 INSPEC Abstract Number: A9517-6630N-006
Title: Structure and morphology of the reaction fronts during the formation of MgAl/sub 2/O/sub 4/ thin films by solid state reaction between R-cut sapphire substrates and MgO films
Author(s): Hesse, D.; Senz, St.; Scholz, R.; Werner, P.; Heydenreich, J.
Author Affiliation: Max-Planck-Inst. fur Mikrostrukturphys., Halle/Saale, Germany
Journal: Interface Science vol.2, no.3 p.221-37
Publication Date: 1994 Country of Publication: Netherlands
CODEN: INSCE9 ISSN: 0927-7056
U.S. Copyright Clearance Center Code: 0927-7056/94/$8.00
Language: English
Abstract: The thin-film spinel forming solid state reaction between Al/sub 2/O/sub 3/ and MgO has been studied under initially non-coherent conditions. MgO **films** in (001) **orientation** on (11.2)-cut sapphire single crystals were heated at 1100 degrees C for 30 min or 1 h. The film/substrate reaction proceeds via cation counterdiffusion as was revealed by a marker experiment. The MgAl/sub 2/O/sub 4/ films formed were predominantly (001) oriented, with an additional systematic tilt of about 5 degrees of the spinel lattice around the (010) axis. The structure of the Al/sub 2/O/sub 3/(11.2)/MgAl/sub 2/O/sub 4/(001) and MgAl/sub 2/O/sub 4/(001)/MgO(001) reaction fronts has been investigated on cross section samples by high-resolution electron microscopy. It appeared that after starting from an incoherent interface, the Al/sub 2/O/sub 3/(11.2)/MgAl/sub 2/O/sub 4/(001) front assumes an almost fully coherent structure during the reaction. As a result the lattice misfit is reduced to 1% and interfacial ledges are formed. The latter most probably play an active role in the necessary c.p.h. to f.c.c. reconstruction of the oxygen sublattice. The MgAl/sub 2/O/sub 4/(001)/MgO(001) reaction front consists of coherent regions divided by misfit dislocations. During the reaction the former run ahead whereas the latter lag behind. As a result the morphology of the reaction front is bowed. The results confirm earlier observations of Carter and Schmalzried of the semicoherent Al/sub 2/O/sub 3//(00.1)CoAl/sub 2/O/sub 4/(111) interface, thus strongly supporting the conclusion of a fundamental new phase transformation mechanism specific to oxide systems.
Subfile: A

5/3,AB/33 (Item 33 from file: 2)
DIALOG(R)File 2:INSPEC

4489340 INSPEC Abstract Number: A9321-8115C-007, B9311-0520F-013
Title: Polycrystalline CuInSe/sub 2/ thin films for solar cells by three-source magnetron sputtering
Author(s): Nakada, T.; Migita, K.; Kunioka, A.
Author Affiliation: Dept. of Electr. Eng. & Electron., Aoyama Gakuin Univ., Tokyo, Japan
Journal: Japanese Journal of Applied Physics, Part 2 (Letters) vol.32, no.8B p.L1169-72
Publication Date: 15 Aug. 1993 Country of Publication: Japan
CODEN: JAPLD8 ISSN: 0021-4922
Language: English
Abstract: Polycrystalline CuInSe/sub 2/ films were deposited in a wide range of Cu/In ratios by three-source magnetron sputtering technique onto soda-lime glass and Mo-coated glass substrates at elevated substrate temperatures. Good run-to-run reproducibility was achieved in our sputtering system using a melt-grown polycrystalline selenium target. In-excess films which are desirable for solar cells were obtained in the temperature range of 400 to 500 degrees C. These **films** showed a preferential (112) **orientation** of the chalcopyrite structure and possessed an excellent adhesion property to the substrates. Preliminary solar cells with ZnO:Al/CdS/CuInSe/sub 2/ structure resulted in a conversion efficiency of 6.3% under AM 1.5 illumination.
Subfile: A B A B

5/3,AB/34 (Item 34 from file: 2)
DIALOG(R)File 2:INSPEC

04324214 INSPEC Abstract Number: A9304-7755-002, B9302-4340-073
Title: Physical characterization of RF sputtered lithium niobate films
Author(s): Rost, T.A.; Baumann, R.C.; Stone, B.A.; Rabson, T.A.
Author Affiliation: Dept. of Electr. & Comput. Eng., Rice Univ., Houston, TX, USA
Conference Title: 1990 IEEE 7th International Symposium on Applications of Ferroelectrics (Cat. No. 90CH2800-1) p.125-8
Publisher: IEEE, New York, NY, USA
Publication Date: 1991 Country of Publication: USA 749 pp.
ISBN: 0 7803 0190 0
U.S. Copyright Clearance Center Code: 0 7803 0190 0/91$01.00
Conference Sponsor: IEEE; American Ceramics Soc.; Office Naval Res
Conference Date: 6-8 June 1990 Conference Location: Urbana-Champaign, IL, USA
Language: English
Abstract: The results of a number of analytical measurements on lithium niobate films deposited on silicon and sapphire substrates of different orientations are reported. It has been determined that high-quality LiNbO/sub 3/ films can be deposited on various substrates through RF sputtering. It has been established that the **orientation** and crystallinity of the **films** is dependent on many parameters. The most important of which are the substrate material and its temperature. Optimizing these parameters has shown that it is possible to produce stoichiometric, polycrystalline thin films of LiNbO/sub 3/ on both silicon and sapphire substrates. It has also been shown that the conduction process in these films is most likely the result of Frenkel-Poole hopping. The

optical quality of the films indicates that waveguiding and such applications as optical doubling, switching, and modulation are possible using these films.
Subfile: A B

5/3,AB/35 (Item 35 from file: 2)
DIALOG(R)File 2:INSPEC

04223326 INSPEC Abstract Number: A9219-6855-022
Title: Growth and properties of a multilayer system based on Y/sub 1/Ba/sub 2/Cu/sub 3/O/sub x/ and amorphous Y-ZrO/sub 2/
Author(s): Boikov, Yu.; Ivanov, Z.G.; Olsson, E.; Alarco, J.A.; Brorsson, G.; Claeson, T.
Author Affiliation: Dept. of Phys., Chalmers Univ. of Technol., Gothenburg, Sweden
Journal: Journal of Applied Physics vol.72, no.1 p.199-202
Publication Date: 1 July 1992 Country of Publication: USA
CODEN: JAPIAU ISSN: 0021-8979
U.S. Copyright Clearance Center Code: 0021-8979/92/130199-04$04.00
Language: English
Abstract: The growth of c-axis oriented Y/sub 1/Ba/sub 2/Cu/sub 3/O/sub x/ thin films on an amorphous buffer layer of Y-ZrO/sub 2/, deposited on sapphire substrates, was investigated. Both films were grown by a pulsed laser deposition technique. A strong correlation was observed between the properties of Y/sub 1/Ba/sub 2/Cu/sub 3/O/sub x/ and the thickness of the buffer layer. A T/sub c/ of 89 K was obtained for an optimal buffer layer thickness of 9 nm. A model that adequately describes the film growth process was developed. A multilayer system of Y/sub 1/Ba/sub 2/Cu/sub 3/O/sub x/ and amorphous Y-ZrO/sub 2/ was grown and a T/sub c/ of 87 K for the upper c-axis oriented layer was measured.
Subfile: A

5/3,AB/36 (Item 36 from file: 2)
DIALOG(R)File 2:INSPEC

03891993 INSPEC Abstract Number: A91074931
Title: Substrate temperature dependence of electrical properties of ZnO:Al epitaxial films on sapphire (1210)
Author(s): Igasaki, Y.; Saito, H.
Author Affiliation: Res. Inst. of Electron., Shizuoka Univ., Hamamatsu, Japan
Journal: Journal of Applied Physics vol.69, no.4 p.2190-5
Publication Date: 15 Feb. 1991 Country of Publication: USA
CODEN: JAPIAU ISSN: 0021-8979
U.S. Copyright Clearance Center Code: 0021-8979/91/042190-06$03.00
Language: English
Abstract: ZnO:Al films were deposited on (1210) oriented sapphire substrates heated up to 400 degrees C by RF magnetron sputtering from a ZnO target mixed with Al/sub 2/O/sub 3/ of 2 wt.%. Films deposited on a substrate heated to a temperature in the range 50-350 degrees C were (0001) oriented single crystals but those grown at 400 degrees C consisted of crystallites with the (0001) and (1101) **orientation**. The former **films** had relatively smooth surfaces whereas the latter exhibited very rough surfaces. Electrical properties such as resistivity, carrier concentration, and the Hall mobility were measured as a function of

substrate temperature. The carrier concentration decreased as the substrate temperature was increased up to 300 degrees C, although the Al content remained unchanged in this temperature range. From these measurements, it was found that the native donors were important as a source of carriers, even in ZnO:Al films. However, it was found that the Hall mobilities for films with a thickness of more than 200 nm experienced minor changes over a growth temperature range from 50 to 350 degrees C. The minimum resistivity obtained was about 1.5*10/sup -4/ Omega cm, a value comparable to that for indium tin oxide film.
Subfile: A

5/3,AB/37 (Item 37 from file: 2)
DIALOG(R)File 2:INSPEC

03392356 INSPEC Abstract Number: A89077835, B89041959
Title: Properties of aluminium-doped ZnO thin films grown by electron beam evaporation
Author(s): Kuroyanagi, A.
Author Affiliation: Dept. of Electr. Eng., Inst. of Vocational & Tech. Educ., Kanagawa, Japan
Journal: Japanese Journal of Applied Physics, Part 1 (Regular Papers & Short Notes) vol.28, no.2 p.219-22
Publication Date: Feb. 1989 Country of Publication: Japan
CODEN: JAPNDE ISSN: 0021-4922
Language: English
Abstract: Highly conductive thin films of ZnO have been prepared by conventional electron beam evaporation on glass substrates. The Al/sub 2/O/sub 3/ content of 0-5 wt.% was added as a dopant into ZnO to decrease the resistivity of ZnO films. An Al-doped ZnO film with a resistivity of 1.0*10/sup -3/ Omega cm is obtained at a substrate temperature of 300 degrees C with 1.0 wt.% Al/sub 2/O/sub 3/ content; transmittance of this film is above 90% in the visible range with 100 nm thickness. The ZnO source material doped with Al/sub 2/O/sub 3/ is evaporated efficiently by a lower electron beam power compared to the case of nondoped ZnO. The c-axis **orientation** of the ZnO **films** is facilitated by the addition of Al/sub 2/O/sub 3/ and the c-axis of Al-doped ZnO films is oriented perpendicular to the glass substrates in the substrate temperature range of 60 degrees C-350 degrees C.
Subfile: A B

5/3,AB/38 (Item 38 from file: 2)
DIALOG(R)File 2:INSPEC

03267694 INSPEC Abstract Number: A89008574
Title: Superconductivity in thin films of Bi-Sr-Ca-Cu oxide deposited via laser ablation of oxide pellets
Author(s): Jaggi, N.K.; Meskoob, M.; Wahid, S.F.; Rollins, C.J.
Author Affiliation: Dept. of Phys., Northeastern Univ., Boston, MA, USA
Journal: Applied Physics Letters vol.53, no.16 p.1551-3
Publication Date: 17 Oct. 1988 Country of Publication: USA
CODEN: APPLAB ISSN: 0003-6951
U.S. Copyright Clearance Center Code: 0003-6951/88/421551-03$01.00
Language: English
Abstract: The authors have grown superconducting films on the technologically important sapphire substrates by CO/sub 2/ pulsed laser

ablation from fully superconducting targets of Bi/sub 2/Sr/sub 3-x/Ca/sub x/Cu/sub 2/O/sub y/ followed by appropriate post-annealing. The composition of the films was found to deviate slightly from the target. Nevertheless, films with metallic resistivity decreasing between room temperature and 95 K, T/sub c/ (onset) of about 90 K and T/sub c/ (zero) of 72 K have been obtained. Magnetoresistance measurements in fields up to 12.85 T give a value of dH/sub c2//dT of 1.6 T/K, which is intermediate between reported values of parallel and perpendicular H/sub c2/ of fully **aligned** thin **films**. The implied partial **orientation** is consistent with the morphology seen by scanning electron microscopy.
Subfile: A

5/3,AB/39 (Item 39 from file: 2)
DIALOG(R)File 2:INSPEC

02824982 INSPEC Abstract Number: A87027217
Title: Epitaxial growth of zirconia and yttria stabilized zirconia films on sapphire substrates by reactive sputtering
Author(s): Konushi, F.; Doi, T.; Matsunaga, H.; Kakihara, Y.; Koba, M.; Awane, K.; Nakamura, I.
Author Affiliation: Central Res. Lab., Sharp Corp., Nara, Japan
Conference Title: Layered Structures and Epitaxy Symposium p.259-64
Editor(s): Gibson, J.M.; Osbourn, G.C.; Tromp, R.M.
Publisher: Mater. Res. Soc, Pittsburgh, PA, USA
Publication Date: 1986 Country of Publication: USA xv+485 pp.
ISBN: 0 931837 21 9
Conference Sponsor: Mater. Res. Soc
Conference Date: 2-4 Dec. 1985 Conference Location: Boston, MA, USA
Language: English
Abstract: Epitaxial single crystal growth of zirconia (ZrO/sub 2/) and yttria stabilized zirconia (ZrO/sub 2/.Y/sub 2/O/sub 3/) films on sapphire substrates was achieved for the first time by using reactive sputtering. And the relations of crystallographic **orientations** between the epitaxial **films** and sapphire substrates was determined. Yttria stabilized zirconia films seem to offer high quality SOI substrates, since the crystal structure of ZrO/sub 2/.Y/sub 2/O/sub 3/ is cubic fluorite and its lattice constant is closely matched to those of semiconductors such as Si and GaAs.
Subfile: A

5/3,AB/40 (Item 40 from file: 2)
DIALOG(R)File 2:INSPEC

02814715 INSPEC Abstract Number: A87027906, B87010373
Title: Photoinduced surface morphology improvement and preferential **orientation** enhancement in **film** deposition of evaporated ZnS
Author(s): Yokoyama, H.
Author Affiliation: Opto-Electron. Res. Labs., NEC Corp., Kawasaki, Japan
Journal: Applied Physics Letters vol.49, no.20 p.1354-6
Publication Date: 17 Nov. 1986 Country of Publication: USA
CODEN: APPLAB ISSN: 0003-6951
U.S. Copyright Clearance Center Code: 0003-6951/86/461354-03$01.00
Language: English
Abstract: Surface photoionization during the deposition of evaporated ZnS resulted in surface morphology improvement and preferential

orientation enhancement of **films** deposited on quartz and sapphire substrates. Such film quality improvement was induced with very low intensity light as long as photon energy was greater than the band-gap energy of deposited ZnS. These features of the photoinduced effect suggest that enhancement of surface adatom rearrangement occurs through a certain nonthermal process resulting from an excited carrier. Such a nonthermal effect is essentially important for lowering the epitaxial growth temperature.

Subfile: A B

10/3,AB/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

6790928 INSPEC Abstract Number: A2001-03-6860-004
Title: Mechanical properties of TiN **films** with the preferred **orientations** by nano-indentation method
Author(s): Matsumuro, A.; Watanabe, T.; Hayashi, T.; Mori, T.; Takahashi, Y.
Author Affiliation: Dept. of Micro Syst. Eng., Nagoya Univ., Japan
Journal: Materials Science Research International Conference Title: Mater. Sci. Res. Int. (Japan) vol.6, no.3 p.180-5
Publisher: Soc. Mater. Sci. Japan,
Publication Date: Sept. 2000 Country of Publication: Japan
CODEN: MSRIFY ISSN: 1341-1683
SICI: 1341-1683(200009)6:3L.180:MPFW;1-T
Material Identity Number: D434-2000-004
Conference Title: Fourth International Symposium on Microstructure and Mechanical Properties of New Engineering Materials (IMMM'99)
Conference Date: 20-23 Sept. 1999 Conference Location: Beijing, China
Language: English
Abstract: TiN films with the (111) and (200) preferred orientations were formed on Si(100) and **sapphire**(0001) substrates by ion-beam-assisted deposition. The difference in the mechanical properties between the (111) and (200) preferred **orientation** in TiN thin **films** was clarified by the nano-indentation technique with the trigonal diamond tip. The experiments revealed significant differences in hardness H and modulus E* irrespective of the substrate materials. The measured values were H=16 GPa, E*=316 GPa for the (200) preferred orientation and H=9 GPa, E*=192 GPa for the (111) preferred orientation. The behavior of the **plastic** deformation in the TiN films was estimated by the cross-sectional SEM observation and the TEM analysis. These microstructural analyses showed significant difference in cross-sectional views of the **plastic** deformation and the intergranular fracture mechanism.
Subfile: A

10/3,AB/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

6789956 INSPEC Abstract Number: A2001-03-8140N-002
Title: Effects of the crystal orientation relationship at the interface of Cu/**Al**/sub 2/**O**/sub 3/ joints on fracture energy
Author(s): Liu Weiping; Elssner, G.; Ruhle, M.
Author Affiliation: Dept. of Mater. Sci. & Eng., Dalian Railway Inst., China
Journal: Acta Metallurgica Sinica vol.36, no.8 p.879-82
Publisher: Science Press,
Publication Date: Aug. 2000 Country of Publication: China
CODEN: CHSPA4 ISSN: 0412-1961
SICI: 0412-1961(200008)36:8L.879:ECOR;1-C
Material Identity Number: A298-2000-010
Language: Chinese
Abstract: Single crystalline Cu and alpha -**Al**/sub 2/**O**/sub 3/ (**sapphire**) with different crystallographic orientation relationships at the interface were diffusion-welded in vacuum with and without a thin

film Nb interlayer. Effects of the **orientation** relationship at the interface on the fracture energy of Cu/**Al**/sub 2/**O**/sub 3/ and Cu/Nb/**Al**/sub 2/**O** /sub 3/ diffusion-bonded joints were studied. Results show that the orientation relationship between Cu and alpha -**Al**/sub 2/**O** /sub 3/ single-crystals at the interface markedly influences the fracture energy of the metal/ceramic joint by changing both the work of adhesion of the metal-ceramic interface and the dissipated energy caused by **plastic** deformation of the metal side of the joint. The Cu/**Al**/sub 2/**O**/sub 3/ joints with the orientation relationship (100)[011]/sub Cu///(0001)[11$\bar{2}$0]/sub **Al2O3** / have the lowest fracture energy values, while the Cu/Nb/**Al**/sub 2/**O**/sub 3/ joints with the same orientation relationship between Cu and **Al** /sub 2/**O**/sub 3/ are the toughest among the tested joints.

Subfile: A

10/3,AB/3 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

6741974 INSPEC Abstract Number: B2000-12-2575F-003

Title: Test and evaluation of chip-to-chip attachment of MEMS devices

Author(s): Sandborn, P.; Swaminathan, R.; Subramanian, G.; Deeds, M.; Cochran, K.

Author Affiliation: CALCE Center for Electron. Packaging, Maryland Univ., College Park, MD, USA

Conference Title: ITHERM 2000. The Seventh Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (Cat. No.00CH37069) p.133-40

Editor(s): Kromann, G.B.; Culham, J.R.; Ramakrishna, K.

Publisher: IEEE, Piscataway, NJ, USA

Publication Date: 2000 Country of Publication: USA 2 vol. (xiii+viii+819) pp.

ISBN: 0 7803 5912 7 Material Identity Number: XX-2000-01810

U.S. Copyright Clearance Center Code: 0 7803 5912 7/2000/$10.00

Conference Title: ITHERM 2000. The Seventh Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems

Conference Sponsor: CPMT/IEEE

Conference Date: 23-26 May 2000 Conference Location: Las Vegas, NV, USA

Language: English

Abstract: In the IC industry, the bond layer serves as the foundation and often the weak link in the reliability of chip packages. MEMS packages are likely to have a greater number of bond layers with more stringent requirements. The additional bond layers arise from multiple interfaces inside the package. The bond layers in MEMS devices often must maintain precise component or chip **alignment**. In addition, the bond **layers** may have to withstand loading from both the macroenvironment and loading within the package. This paper presents the bond requirements for a MEMS based Safety and Arming (S&A) device. The S&A system requires precise alignment between a micromachined silicon chip, a patterned **Alumina** ceramic chip, and a deflection delimiter. Several candidate designs were subjected to a series of environmental tests including thermal cycling, accelerated stress tests, mechanical shock, and combinations of the above conditions. A Scanning Acoustic Microscope (SAM) is utilized to measure initial delamination and to identify incremental damage due to environmental exposure. The tests are ultimately used to rank the suitability of the bond layer material for chip-to-chip attachment with

large coefficient of expansion differences. Tested bond materials include epoxy, **thermoplastic**, and solder.
Subfile: B

10/3,AB/4 (Item 4 from file: 2)
DIALOG(R)File 2:INSPEC

5901918 INSPEC Abstract Number: A9811-6860-007
Title: Effects of thermal gradient and residual stresses on thermal barrier coating fracture
Author(s): Qian, G.; Nakamura, T.; Berndt, C.C.
Author Affiliation: Dept. of Mech. Eng., State Univ. of New York, Stony Brook, NY, USA
Journal: Mechanics of Materials vol.27, no.2 p.91-110
Publisher: Elsevier,
Publication Date: Feb. 1998 Country of Publication: Netherlands
CODEN: MSMSD3 ISSN: 0167-6636
SICI: 0167-6636(199802)27:2L.91:ETGR;1-M
Material Identity Number: C554-98003
U.S. Copyright Clearance Center Code: 0167-6636/98/$19.00
Language: English
Abstract: Driving mechanisms which lead to internal crack growth and failure in the thermally sprayed coatings are identified using detailed finite element models. Coatings are assumed to contain embedded cracks and they are thermally loaded according to a typical high temperature environment, In order to determine the accurate stress state, the thermal gradient within the coating is calculated from the steady-state heat transfer analysis. Our models take into account various locations of cracks, temperature-dependent and temperature-independent **plasticity**, thermal conductivities of different layers and thermal insulation across crack surfaces. The results indicate that the energy release rate of large cracks can reach close to fracture toughness of ceramic coatings. We have also studied the effect of residual stresses on the fracture behaviour. For a penny-shaped crack located parallel to the coating layers, a limited influence of residual stresses is observed. The effect is more pronounced when the crack **orientation** is perpendicular to the **coating layers** when: it has shown a beneficial influence. In both cases, the effects of residual stresses are relevant to the cracks close to the ceramic-bond interface. In addition, we have modeled functionally graded material and investigated its mechanical influence on the embedded cracks. The implications of the present work to internal crack initiation and growth, which can lead to coating failure, are also addressed.
Subfile: A

10/3,AB/5 (Item 5 from file: 2)
DIALOG(R)File 2:INSPEC

5839993 INSPEC Abstract Number: A9807-8120L-024
Title: Microstructure formation in ceramic injection molding
Author(s): Pabst, W.; Havrda, J.; Gregorova, E.
Author Affiliation: Dept. of Glass & Ceramics, Prague, Czech Republic
Journal: Key Engineering Materials Conference Title: Key Eng. Mater. (Switzerland) vol.132-1361 p.416-19

Publisher: Trans Tech Publications,
Publication Date: 1997 Country of Publication: Switzerland
CODEN: KEMAEY ISSN: 1013-9826
SICI: 1013-9826(1997)132/1361L.416:MFCI;1-1
Material Identity Number: K935-97005
Conference Title: 5th European Ceramic Conference. Euro Ceramics V. Extended Abstracts
Conference Date: 22-26 June 1997 Conference Location: Versailles, France
Language: English
Abstract: **Thermoplastic alumina** pastes which serve as a feedstock for ceramic injection molding are modelled as Herschel-Bulkley fluids exhibiting a well defined yield stress value in Poiseuille tube flow. Flow curves of these pastes are determined for different temperatures by rheological measurements with a specially constructed high-temperature capillary viscometer, and, based on the known constitutive equation, velocity profiles are calculated and verified for the temperatures of interest. Bulk density measurements and the microscopic evaluation of polished sections reveal the strong correlation between velocity profile and microstructure. Image analysis is used to quantify some of the qualitative findings (porosity profiles, particle **orientation** in the shear **layer**).
Subfile: A

10/3,AB/6 (Item 6 from file: 2)
DIALOG(R)File 2:INSPEC

5403238 INSPEC Abstract Number: A9623-8140N-030
Title: **Orientation** dependent crack patterns in **alumina films** on NiAl single crystals due to spherical indentation
Author(s): Hollatz, M.; Bobeth, M.; Pompe, W.; Marx, V.
Author Affiliation: Max-Planck-Gesellschaft, Dresden, Germany
Journal: Acta Materialia vol.44, no.10 p.4149-59
Publisher: Elsevier,
Publication Date: Oct. 1996 Country of Publication: USA
CODEN: AMATEB ISSN: 1359-6454
SICI: 1359-6454(199610)44:10L.4149:ODCP;1-Q
Material Identity Number: N634-96010
U.S. Copyright Clearance Center Code: 1359-6454/96/$15.00+0.00
Language: English
Abstract: Spherical indentations on (100), (110) and (111) oriented NiAl at room temperature caused anisotropic surface topographies around the indents which revealed the highly anisotropic **plastic** deformation of NiAl. No cracks were observed at the surface of non-oxidized samples. For oxidized samples, radial and circumferential-like cracks in the **alumina** film around the indent indicated circumferential and radial tensile strains at the NiAl surface depending on the in-plane crystal direction. Unlike the case of isotropic **plastic** deformation, on (100) NiAl, a sinking-in of the surface at the periphery of the indent was connected with circumferential tensile strains in special directions as indicated by the appearance of radial cracks.
Subfile: A

10/3,AB/7 (Item 7 from file: 2)

DIALOG(R)File 2:INSPEC

03505776 INSPEC Abstract Number: A89143541
Title: The effects of surface films on mechanical behavior of B2 ordered intermetallic alloys
Author(s): Noebe, R.D.; Kim, J.T.; McVay, J.W.; Gibala, R.
Author Affiliation: Dept. of Mater. Sci. & Eng., Michigan Univ., Ann Arbor, MI, USA
Conference Title: Strength of Metals and Alloys (ICSMA 8) Proceedings of the 8th International Conference p.415-20 vol.1
Editor(s): Kettunen, P.O.; Lepisto, T.K.; Lehtonen, M.E.
Publisher: Pergamon, Oxford, UK
Publication Date: 1988 Country of Publication: UK 3 vol. xxiv+1503 pp.
ISBN: 0 08 034804 1
Conference Sponsor: Outokumpu Oy; Rauma-Repola Oy; et al
Conference Date: 22-26 Aug. 1988 Conference Location: Tampere, Finland
Language: English
Abstract: Surface films deposited on body-centered cubic metals can greatly reduce the yield and flow stresses and increase the ductility at low homologous temperatures. This softening process is associated with the ability of the film-substrate interface to generate large populations of mobile edge dislocations. This phenomenon is extended to B2 ordered intermetallic alloys, which display many deformation characteristics of BCC metals. Single crystal NiAl coated with thermally formed oxide films and polycrystalline FeAl with eletrochemically formed Fe-**Al**-O films display film softening at and below room temperature. The extent of film softening is shown to depend on many factors, including crystal **orientation**, deformation temperature, operative slip systems, **film** thickness, film adherence, and film and substrate properties.
Subfile: A

10/3,AB/8 (Item 8 from file: 2)
DIALOG(R)File 2:INSPEC

02166976 INSPEC Abstract Number: A84007638
Title: Structure of transient oxides formed on NiCrAl alloys
Author(s): Smialek, J.L.; Gibala, R.
Author Affiliation: NASA Lewis Res. Center, Cleveland, OH, USA
Journal: Metallurgical Transactions A (Physical Metallurgy and Materials Science) vol.14A, no.10 p.2143-61
Publication Date: Oct. 1983 Country of Publication: USA
CODEN: MTTABN ISSN: 0360-2133
Language: English
Abstract: The structure of transient scales formed on pure, Y-doped, and Zr-doped NiCrAl alloys was examined by transmission electron microscopy. Oxidation for 0.1 hour in 1100 degrees C air produced many of the features observed in mature alpha -**Al**/sub 2/**O**/sub 3/ scales, but on a much finer degree: randomly oriented 0.1 to 0.2 mu m grains, dispersed porosity decreasing in size and amount toward the oxide-metal interface, and indications of strain and deformation. Other layers in the scale contained structures which preceded the random alpha -**Al**/sub 2/ **O**/sub 3/ layer: gamma -**Al**/sub 2/**O**/sub 3/, alpha -(Al, Cr)/sub 2/O/sub 3/, or Ni(Al, Cr)/sub 2/O/sub 4/ oxides which were composed of 0.1 mu m subgrains having nearly the same crystallographic **orientation**. These **layers** were densely populated with internal

precipitates and Moire patterns. The underlying metal structures showed evidence of **plastic** flow (dislocations) due to growth stresses in the oxide and recovery of these interface dislocations into low energy networks.
Subfile: A

10/3,AB/9 (Item 1 from file: 32)
DIALOG(R)File 32:METADEX(R)

1237542 MA Number: 200012-55-2523
Effects of the crystal orientation relationship at the interface of Cu/Al sub 2 O sub 3 joints on fracture energy.
Liu, W ; Elssner, G ; Ruhle, M
Dalian Railway Institute (China)
China, 2000
Acta Metallurgica Sinica (China) 36, (8), 879-882 18 Aug. 2000
ISSN: 0412-1961
Country of Publication: China
Journal Announcement: 0012
Language: CHINESE
Abstract: Single crystalline Cu and alpha -Al sub 2 O sub 3 (sapphire) with different crystallographic orientation relationships at the interface were diffusion-welded in vacuum with and without a thin film Nb interlayer. Effects of the orientation relationship at the interface on the fracture energy of Cu/Al sub 2 O sub 3 and Cu/Nb/Al sub 2 O sub 3 diffusion-bonded joints were studied. Results show that the orientation relationship between Cu and alpha -Al sub 2 O sub 3 single-crystals at the interface remarkably influences the fracture energy of the metal/ceramic joint by changing both the work of adhesion of the metal-ceramic interface and the dissipated energy caused by plastic deformation of the metal side of the joint. The Cu/Al sub 2 O sub 3 joints with the orientation relationship (100)[011] sub Cu //(0001)[1120] sub Al2O3 have the lowest fracture energy values, while the Cu/Nb/Al sub 2 O sub 3 joints with the same orientation relationship between Cu and Al sub 2 O sub 3 are the toughest among the tested joints. Photomicrographs; Graphs. 6 ref.

10/3,AB/10 (Item 2 from file: 32)
DIALOG(R)File 32:METADEX(R)

1134533 MA Number: 199806-57-0915
Effects of thermal gradient and residual stresses on thermal barrier coating fracture.
Nakamura, T ; Qian, G ; Berndt, C C
State University of New York (Stony Brook)
Netherlands, 1998
Mechanics of Materials 27, (2), 91-110 Feb. 1998
ISSN: 0167-6636
Country of Publication: Netherlands
Journal Announcement: 9806
Language: ENGLISH
Abstract: Driving mechanisms which lead to internal crack growth and failure in the thermally sprayed coatings are identified using detailed finite element models. Coatings are assumed to contain embedded cracks and they are thermally loaded according to a typical high temperature environment. In order to determine the accurate stress state, the thermal

gradient within the coating is calculated from the steady-state heat transfer analysis. Our models take into account various locations of cracks, temperature-dependent and -independent plasticity, thermal conductivities of different layers and thermal insulation across crack surface. The results indicate that the energy release rate of large cracks can reach close to fracture toughness of ceramic coatings. We have also studied the effect of residual stresses on the fracture behavior. For a penny-shaped crack located parallel to the coating layers, a limited influence of residual stresses is observed. The effect is more pronounced when the crack orientation is perpendicular to the coating layers where it has shown a beneficial influence. In both cases, the effects of residual stresses are relevant to the cracks close to the ceramic-bond interface. In addition, we have modeled functionally graded material and investigated its mechanical influence on the embedded cracks. The implications of the present work to internal crack initiation and growth, which can lead to coating failure, are also addressed. (Example materials: yttria-stabilized zirconia coating on nickel CrAlY interphase on titanium alloy Ti64 substrate. Also considered: functionally gradient materials and an alumina-titania system.) Numerical Data; Photomicrographs; Graphs. 33 ref.

10/3,AB/11 (Item 1 from file: 6)
DIALOG(R)File 6:NTIS

2225267 NTIS Accession Number: ADA397578/XAB
Ultrasonic Extrusion: Reduction in Vehicle and **Plasticizer** Requirements for Non-Clay Ceramics
Tarpley, W. B. ; Yocom, K. H. ; Pheasant, R.
Aeroprojects, Inc., West Chester, PA.
Corp. Source Codes: 000508000; 009350
Nov 1961 68p
Languages: English
Journal Announcement: USGRDR0209
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NTIS Prices: PC A05/MF A01
Earlier work on the ultrasonic extrusion of lead and aluminum has been extended to the cold extrusion of **plasticized** ceramic compositions, resulting in significant improvements in increased extrusion rate (more than 100-fold), decreased extrusion pressure (2 to 10 fold), and in extruded specimen properties. It has also been found possible to extrude materials which are normally nonextrudable because of their low **plasticizer** or water content. Fused, ground **alumina** could be ultrasonically extruded with 15% less water than the minimum content without ultrasonics, and only 40 to 60% of that used in normal commercial practice. Significant improvement in the strength of as-extruded shapes, as well as reduced shrinkage and deformation in drying and firing, resulted. Compositions normally using 3 w/o ammonium alginate as a **plasticizer** can be extruded with 0.2 w/o plastizer when ultrasonically activated. It has been postulated that the ultrasonic effects observed are derived from reduction of surface friction, shear thinning of the thixotropic systems, particle **orientation**, surface-**film** rupture, and wetting phenomena. As-extruded specimen improvement was evidenced by a smoother surface and freedom from cracks, tearing, and peeling. When steel dies were used, abrasion of the die surface sometimes caused a superficially

discolored surface in nonultrasonic extrusions. The comparable ultrasonic extrusions showed little or no discoloration as the ultrasonic power level was increased. Ultrasonically extruded specimens which were fired in the same kiln loading as their corresponding controls show small but consistent increases in fired density. Water absorption was approximately 75% of the control. The highest moduli of rupture in the fired specimens were found in the ultrasonic specimens even though these required only 25% of the extrusion pressure of the controls.

10/3,AB/12 (Item 2 from file: 6)
DIALOG(R)File 6:NTIS

1810822 NTIS Accession Number: AD-A279 197/8
Crystallographic Model of (00.1) Aluminum Nitride Epitaxial Thin Film Growth on (00.1) **Sapphire** Substrate
Sun, C. J. ; Kung, P. ; Saxler, A. ; Ohsato, H. ; Haritos, K.
Northwestern Univ., Evanston, IL. Dept. of Electrical Engineering and Computer Science.
Corp. Source Codes: 007740095; 411825
15 Apr 94 4p
Languages: English Document Type: Journal article
Journal Announcement: GRAI9417
Pub. in Jnl. of Applied Physics, v75 v8 p3964-3967, 15 Apr 94.
NTIS Prices: Not available NTIS
High-quality thin aluminum nitride **films** were grown on different **orientations** of **sapphire** substrates by metalorganic chemical vapor deposition. (00.1) AlN thin film grown on (00.1) A1203 has better crystallinity than (11.0) AlN on (01.2) **sapphire**. Full width at half maximum of a rocking curve is 97.2 arcsec, which is the narrowest value to our knowledge. A crystallographic model between AlN thin films and **sapphire** substrates was proposed to explain the process of crystal growth. Extended atomic distance mismatch which is the mismatch of atomic distance for a longer period was introduced. It is shown that the mismatch is relaxed by edge-type dislocations. Extended atomic distance mismatch was used to interpret the results that (00.1) AlN has better crystallinity than (11.0) AlN, but (11.0) GaN has better crystallinity than (00.1) GaN.

10/3,AB/13 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

03404724
E.I. Monthly No: EI9204043985
Title: Processing of functional ceramics by metallorganic route.
Author: Hirano, Shin-ichi; Yogo, Toshinobu; Kikuta, Ko-ichi
Corporate Source: Nagoya Univ, Nagoya, Jpn
Source: Nippon Seramikkusu Kyokai Gakujutsu Ronbunshi/Journal of the Ceramic Society of Japan v 99 n 1154 Oct 1991 p 1026-1035
Publication Year: 1991
CODEN: NSKRE2 ISSN: 0914-5400
Language: English
Abstract: Functional ceramics with controlled microstructure were successfully synthesized through metallorganics. The controlled hydrolysis of metal alkoxides yields BaO-TiO//2 powders, which could be sintered to the microwave dielectrics of improved properties. Zirconia toughened ceramics were fabricated by a novel processing using zirconia-coated

composite powders of silica or mullite synthesized via cohydrolysis of zirconium alkoxide on dispersed starting powders. Zirconia-mullite composite powders were sintered affording compacts dispersed uniformly with zirconia particles, which showed the increased fracture toughness and designed microstructure. The controlled hydrolysis of lithium and niobium alkoxides was found to form the double alkoxide in a solution, which was converted to stoichiometric LiNbO//3 powders, films and fibers. Crystalline, epitaxial LiNbO//3 films with stoichiometry were prepared on **sapphire** substrate at 250 degree C. The **orientation** and crystallinity of LiNbO//3 **films** could be controlled by the selection of the crystallographic plane of a substrate as well as the crystallization conditions. Carbon of controlled morphology dispersed with finely metal or metallic compound particles can be synthesized in high carbon yield by the pressure pyrolysis of organometallic polymers. Magnetite-dispersed spherulitic carbon was synthesized from organoiron copolymer-water system. This paper describes the results and features of the ceramic processing through metallorganics. (Author abstract) 27 Refs.

10/3,AB/14 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

08895672 Genuine Article#: 341ZR Number of References: 30
Title: Electrophoretic deposition forming of nickel-coated-carbon-fiber-reinforced borosilicate-glass-matrix composites (ABSTRACT AVAILABLE)
Author(s): Kaya C (REPRINT) ; Boccaccini AR; Chawla KK
Corporate Source: UNIV BIRMINGHAM,INTERDISCIPLINARY RES CTR HIGH PERFORMANCE APPLIC/BIRMINGHAM B15 2TT/W MIDLANDS/ENGLAND/ (REPRINT); UNIV BIRMINGHAM,SCH MET & MAT/BIRMINGHAM B15 2TT/W MIDLANDS/ENGLAND/; TECH UNIV ILMENAU,FACHGEBIET WERKSTOFFTECH/D-98684 ILMENAU//GERMANY/; UNIV ALABAMA,DEPT MECH & MAT ENGN/BIRMINGHAM//AL/35294; YILDIZ TECH UNIV,DEPT ENGN MET/TR-8750 ISTANBUL//TURKEY/
Journal: JOURNAL OF THE AMERICAN CERAMIC SOCIETY, 2000, V83, N8 (AUG), P 1885-1888
ISSN: 0002-7820 Publication date: 20000800
Publisher: AMER CERAMIC SOC, 735 CERAMIC PLACE, PO BOX 6136, WESTERVILLE, OH 43081-6136
Language: English Document Type: ARTICLE
Abstract: The present paper introduces a novel processing technique that involves in situ electrophoretic deposition (EPD), followed by pressureless sintering, to produce dense, defect-minimized, carbon-fiber-reinforced borosilicate-glass-matrix composites with a nickel interface, The process relies on the deposition of submicrometer-sized, colloidal charged particles onto unidirectionally **aligned** nickel-**coated** carbon fibers. The preparation and characterization of a kinetically stable nanosized borosilicate sol suitable for EPD are described. The most-important EPD processing parameters in the formation of dense, fully infiltrated, green-body compacts are described, and issues that concern the infiltration of very tight carbon fiber preforms are discussed and effectively solved. Using the crack-path-propagation test, the metallic nickel interface is determined to he very effective to improve the composite mechanical performance, in terms of the nonbrittle fracture behavior. Catastrophic track growth is prevented by such mechanisms as constrained **plastic** deformation of the interface and fiber debonding and pullout. The proposed processing technique has great potential to fabricate defect-minimized and damage-tolerant fiber-reinforced

brittle-matrix composites with a ductile interface, Overall, this new approach offers a cost-effective and short-time processing route for the fabrication of continuous-fiber-reinforced ceramic-matrix composites.

10/3,AB/15 (Item 2 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

07672604 Genuine Article#: 194TA Number of References: 51
Title: Effect of microstructure on wear behavior of Al-Mg-Si alloy matrix-10 vol.% **Al2O3** composite (ABSTRACT AVAILABLE)
Author(s): Hong SI (REPRINT) ; Seo YS
Corporate Source: CHUNGNAM NATL UNIV,DEPT MET ENGN, TAEDOK SCI TOWN/TAEJON//SOUTH KOREA/ (REPRINT); KIA STEEL CO LTD,MAT RES & DEV CTR/KUNSAN//SOUTH KOREA/
Journal: MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING, 1999, V265, N1-2 (JUN 15), P 29-41
ISSN: 0921-5093 Publication date: 19990615
Publisher: ELSEVIER SCIENCE SA, PO BOX 564, 1001 LAUSANNE, SWITZERLAND
Language: English Document Type: ARTICLE
Abstract: The wear resistance of under-aged and peak-aged 6061 Al-**Al2O3** particulate composite has been investigated. Peak-aged composites were more wear-resistant than the under-aged composite, while the plane perpendicular to the extrusion direction was more wear-resistant than that parallel to the extrusion direction. The difference of the wear resistance between two different orientations was observed to be greater than that between under-aged and peak-aged matrix microstructures. It shows that preferential orientation of patriculates has a greater effect on the wear resistance than the change of the matrix microstructure. The difference of wear properties between two different orientations was explained by the effect of preferentially orientated reinforcing particles on the shear modulus and shear deformation. The shearing force on the plane perpendicular to the extrusion direction forces the Volume beneath a rotating wheel to undergo semi-iso-shear-strain deformation, which requires greater force. The greater resistance to shearing force of the plane perpendicular to the extrusion direction would delay the **plastic** flow and subsurface damage, which improves the wear resistance.

10/3,AB/16 (Item 3 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

03305961 Genuine Article#: NU614 Number of References: 13
Title: STRUCTURE AND MECHANICAL-PROPERTIES OF NANOCRYSTALLINE AG/MGO COMPOSITES (Abstract Available)
Author(s): KIZUKA T; ICHINOSE H; ISHIDA Y
Corporate Source: NAGOYA UNIV,SCH ENGN,DEPT APPL PHYS,FURO CHO,CHIKUSA KU/NAGOYA/AICHI 464/JAPAN/; UNIV TOKYO,INST IND SCI,MINATO KU/TOKYO 106//JAPAN/
Journal: JOURNAL OF MATERIALS SCIENCE, 1994, V29, N12 (JUN 15), P3107-3112
ISSN: 0022-2461
Language: ENGLISH Document Type: ARTICLE
Abstract: Nanocrystalline Ag/MgO composites were prepared by the

ultrafine-powder-compaction method. The structure was investigated for the first time by high-resolution electron microscopy. Nanometre-sized Ag grains and MgO grains in the composites bonded directly without any intermediate phase **layer**. Certain preferred **orientation** relationships were observed between the Ag and MgO grains. The nanocrystalline Ag/MgO composites retained their grain size during annealing up to 873 K. Vickers microhardness measurements were performed on the as-compacted and annealed specimens. Generation and propagation of cracks were less active in the nanocrystalline Ag/MgO composites than in a single-phase nanocrystalline MgO. The Vickers microhardness of the nanocrystalline Ag/MgO composites remained up to 1073 K. Hot-pressing deformation tests showed that the nanocrystalline Ag/MgO composites deformed **plastically** at 1073 K.

10/3,AB/17 (Item 4 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

01872667 Genuine Article#: JH474 Number of References: 35
Title: SOLUTION-CONDENSED YBA2CU3O7-X SUPERCONDUCTOR THIN-FILMS FROM **THERMOSETTING** METAL-ORGANIC PRECURSORS (Abstract Available)
Author(s): PAK SS; MONTGOMERY FC; DUGGAN DM; CHEN KC; MAZDIYASNI KS; TSAI PK; PAULIUS LM; MAPLE MB
Corporate Source: GEN ATOM CO/SAN DIEGO//CA/92186; BABCOCK & WILCOX RES CTR/LYNCHBURG//VA/00000; UNIV CALIF SAN DIEGO,INST PURE & APPL PHYS SCI/LA JOLLA//CA/92093; UNIV CALIF SAN DIEGO,DEPT PHYS/LA JOLLA//CA/92093
Journal: JOURNAL OF THE AMERICAN CERAMIC SOCIETY, 1992, V75, N8 (AUG), P 2268-2275
Language: ENGLISH Document Type: ARTICLE
Abstract: Two different multimetal organic compounds were synthesized and used to deposit thin Y:Ba:Cu oxide films on selected metal and ceramic substrates by the dip-coating method. The rheology of the precursors is strongly influenced by the organic ligand, types of solvent, solvent-water molar ratio, and processing method. The precursor compounds were converted to suitable viscosity to achieve uniform film thickness processing on complex geometry. Superconducting transition temperatures T(c) in the range of 89 to 93 K have been measured, depending on processing parameters used. The critical current density, J(c) of the solution-coated films had values comparable to those for polycrystalline samples. Y123 **films** exhibit c-axis **alignment** on Ag substrates. A prototype high-Q cavity was coated with Y123 and its performance was evaluated.

10/3,AB/18 (Item 1 from file: 35)
DIALOG(R)File 35:Dissertation Abs Online

01730097 AADAAI9958951
Stabilization mechanisms and fast drying of high solids water-based tapes
Author: Lakhwani, Shahid G.
Degree: Ph.D.
Year: 2000
Corporate Source/Institution: Rutgers The State University of New Jersey - New Brunswick (0190)
Source: VOLUME 61/01-B OF DISSERTATION ABSTRACTS INTERNATIONAL. PAGE 472. 209 PAGES

Tape casting, a low cost process for the fabrication of thin, flat ceramics has traditionally utilized organic solvents such as toluene to allow fast drying. Due to the hazardous nature of such solvents their emissions are regulated and therefore the use of water to replace them has recently received considerable attention. Although cheap <italic>and</italic> environmentally benign the high latent heat of vaporization of water hinders drying. Because of this the use of water-based systems has been limited to only the thinnest of tapes (<<math> <f> ∼</f> </math>100μm).

In the present work high solids slips were successfully used to overcome this problem of slow drying. These slips were prepared by optimizing the dispersant, the working pH range and via a novel approach described as “step-wise additions.” In the absence of organic additives, a number of methods proved useful for providing good stabilization, leading to high solids. With binder additions, the problem of tangling was shown to be escalated with long chain dispersants and minimized in systems relying only on strong acids for stabilization.

The presence of a steric force was shown to be essential in order to achieve good stabilization over a wide pH range. In the case of citric acid, this force was shown to be of an atypical nature, arising due to the compression of **aligned** water **layers** solvating the citric acid adsorbed on the **alumina** powders. The stabilization studies were also extended to investigate the effects of seven other organic acids which were structurally related to citric acid.

Increasing the solids loading of the starting slips was shown to enhance the drying kinetics of the tapes. Furthermore five different drying variables were also optimized to accelerate these kinetics. Tapes cast at doctor blade openings of 40 mils, using a 64 vol% slip were dried in under 10 minutes compared to a 20 minute drying time for organic solvent based tapes of a similar thickness.

An alternative approach, using low solids slips with excess binder and **plasticizer** additions was also used to obtain highly flexible tapes that could be <italic>gelled</italic> and removed from the carrier film in about 10–15 minutes.

10/3,AB/19 (Item 2 from file: 35)
DIALOG(R)File 35:Dissertation Abs Online

01112169 AAD9019365
STUDIES OF POLYMER MICROSTRUCTURES BY OPTICAL EVANESCENT WAVE TECHNIQUES
Author: PIRNIA, ABOLHASSAN
Degree: PH.D.
Year: 1989
Corporate Source/Institution: THE UNIVERSITY OF CONNECTICUT (0056)
Source: VOLUME 51/02-B OF DISSERTATION ABSTRACTS INTERNATIONAL.
PAGE 777. 260 PAGES

This research was conducted to examine the characteristics of polymer adsorption on a plane surface and to analyze the molecular orientation in injection **molded** liquid crystalline **polymers** (LCPs). The technique of Attenuated Total Reflection (ATR) using the evanescent wave was employed in the Ultraviolet (UV) and Infrared (IR). For polymer adsorption, an optical set-up was designed with a specially designed **sapphire** crystal and a fiber-optic spectrometer. For molecular orientation measurements, a semi-permanent attachment was designed and installed in a FT-IR spectrometer. The adsorption of polydisperse poly

(N-vinylcarbazole) was studied from four solution concentrations in toluene at the theta temperature in contact with the (4150) crystallographic surface of **sapphire**. The adsorption kinetics occurred over a period of ten hours. The concentration profiles of the adsorbed layers in contact with solution were examined by performing angle-resolved experiments. An exponential concentration profile was assumed which was used to extract characteristic adsorption parameters. The adsorbed amount was found to be in the range of 1.4 to 1.8 mg/m$\sp2$. The adsorption isotherm was rounded and seemed to level off at the highest solution concentration. The root-mean-square thickness was found to be in the range of 300 to 400 Angstroms, higher by less than two times the radius of gyration of the polymer in solution. FT-IR ART dichroism proved to be a valuable technique in determining the orientation profiles in an injection molded plaque of a wholly aromatic copolyester. Orientation functions were measured at eight positions as a function of distance from the gate and at four positions in the thickness direction. A complex three-dimensional orientation profile was measured. This profile was analyzed in terms of flow models developed for fiber-reinforced **thermoplastics** and proposals regarding structural rearrangements in LCPs. On the basis of the **orientation** data in the sub-skin **layer**, a rough estimate has been made for the orientability parameter. A value close to unity has been calculated that could be regarded a phenomenological material parameter signifying the tendency of the chains to align in the flow field.

10/3,AB/20 (Item 1 from file: 94)
DIALOG(R)File 94:JICST-EPlus

01699789 JICST ACCESSION NUMBER: 93A0115554 FILE SEGMENT: JICST-E
Morphological Study of the Wear of Crystalline Polymers. (Part 4). Sliding Friction for **Alumina** Ceramics/Ultrahigh Molecular Weight Polyethylene System.
HIRONAKA SEIICHIRO (1); KOMOTO TADASHI (2); NAKAMURA YOSHIO (2)
(1) Tokyo Inst. of Technology, Faculty of Engineering; (2) Gunma Univ., Faculty of Technology
Sekiyu Gakkaishi(Journal of the Japan Petroleum Institute), 1993, VOL.36,NO.1, PAGE.22-26, FIG.9, TBL.1, REF.9
JOURNAL NUMBER: F0042AAZ ISSN NO: 0582-4664 CODEN: SKGSA
UNIVERSAL DECIMAL CLASSIFICATION: 539.3/.5
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Original paper
MEDIA TYPE: Printed Publication
ABSTRACT: A morphological study was made to examine the friction and wear mechanism of ultrahigh molecular weight polyethylene(UHMWPE), in which UHMWPE was slid against **alumina** ceramics in air and in water, and carbom replica films of the UHMWPE worn surface and **alumina** ceramics frictional surface were examined by transmission electron microscopy(TEM). The differences in friction and wear properties in air and in water, were discussed from the following points of view: (1) the lubricities of water, (2) the exclusion of water from the interface of UHMWPE and **alumina** ceramics under high loads, (3) the adhesion and tranfer of UHMWPE to the counter surface and (4) the surface deformation of UHMWPE by shear-stress. Electron diffractions of carbon replica **films** claried the molecular **orientations** on frictional surfaces of UHMWPE, both in air and in water. (author abst.)

10/3,AB/21 (Item 2 from file: 94)
DIALOG(R)File 94:JICST-EPlus

00646401 JICST ACCESSION NUMBER: 88A0402956 FILE SEGMENT: JICST-E
The formation of spinel-type iron oxide thin **films** with (100) **orientation** by plasma assisted MO-CVD.
FUJII EIJI (1); TORII HIDEO (1); AOKI MASAKI (1)
(1) Matsushitadenkisangyo Kaiken
Funtai oyobi Funmatsu Yakin(Journal of the Japan Society of Powder and Powder Metallurgy), 1988, VOL.35,NO.3, PAGE.202-204, FIG.5, REF.8
JOURNAL NUMBER: F0691AAD ISSN NO: 0532-8799 CODEN: FOFUA
UNIVERSAL DECIMAL CLASSIFICATION: 539.23:54-31
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Short Communication
MEDIA TYPE: Printed Publication
ABSTRACT: Thin films of spinel-type iron oxides with (100) orientation were prepared from Ferrocene as a starting material by Plasma assisted CVD. The X-ray diffraction patterns of the **films** showed that the (100) **orientation** was dependent on both the flow rate ratio of Ferrocene to Oxygen and the total gas pressure, but independent on Plasma RF power and substrates (Si(111), Si(100), Glass, saphire(012), saphire(001) and Polyimide film).(author abst.)

10/3,AB/22 (Item 1 from file: 144)
DIALOG(R)File 144:Pascal

13643871 PASCAL No.: 98-0350561
Plasmavorbehandlung und Beschichtung von Kunststoffolien
(Plasma pretreatment and coating of polymer films Part 1 : Coating of non-treated polymer films)
MOOSHEIMER U
Journal: Materialwissenschaft und Werkstofftechnik, 1998, 29 (6) 312-324
Language: German
The food packaging industry demands cheap polymer films possessing a high barrier against permeation of gases, moisture and flavor. Candidates for the most successful materials fulfilling these requirements are vacuum web coated biaxial oriented polypropylene (BOPP) films containing a thin inorganic barrier layer. For a good adhesion of the barrier layer on the BOPP films, the polymer film must be pretreated. The industry uses the Corona atmosphere plasma. This work is separated in three parts. The first part describes the experimental setup and the properties of vacuum web coated layers on polymer films. The next part contains the results of the systematic modification of polymer surfaces by atmosphere and low pressure plasmas. The influence of the surface properties on the final functionality of the coated films is given. In the last part, the discussion of the results of the first and second part reveals systematic relations between the production parameters of the high barrier films and their final functionality. These results firstly reveal the adhesion mechanism of the inorganic barrier layers of the polymer films and the necessary surface properties of the polymer films, in order to get cheap high barrier films by vacuum web coating.

18/3,AB/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

5693996 INSPEC Abstract Number: A9720-8140L-025
Title: Microstructure and high-temperature mechanical behavior of alumina/alumina-yttria-stabilized tetragonal zirconia multilayer composites
Author(s): Jimenez-Melendo, M.; Clauss, C.; Dominguez-Rodriguez, A.; Sanchez-Herencia, A.J.; Moya, J.S.
Author Affiliation: Dept. de Fisica de la Mater. Condensada, Sevilla, Spain
Journal: Journal of the American Ceramic Society vol.80, no.8 p. 2126-30
Publisher: American Ceramic Soc,
Publication Date: Aug. 1997 Country of Publication: USA
CODEN: JACTAW ISSN: 0002-7820
SICI: 0002-7820(199708)80:8L.2126:MHTM;1-S
Material Identity Number: J107-97011
U.S. Copyright Clearance Center Code: 0002-7820/97/$5.00+.50
Language: English
Abstract: Layered composites of alternate layers of pure Al/sub 2/O/sub 3/ (thickness of 125 mu m) and 85 vol% Al/sub 2/O/sub 3/-15 vol% ZrO/sub 2/ that was stabilized with 3 mol% Y/sub 2/O/sub 3/ (thickness of 400 mu m) were obtained by sequential slip casting and then fired at either 1550 degrees or 1700 degrees C. Constant-strain-rate tests were conducted on these materials in air at 1400 degrees C at an initial strain rate of 2*10/sup -5/ s/sup -1/. The load axis was applied both parallel and **perpendicular** to the layer interfaces. Catastrophic failure occurred for the composite that was fired at 1700 degrees C, because of the coalescence of cavities that had developed in grain boundaries of the Al/sub 2/O/sub 3/ layers. In comparison, the composite that was fired at 1550 degrees C demonstrated the ductility of the Al/sub 2/O/sub 3/+YTZP layer, but at a flow stress level that was determined by the Al/sub 2/O/sub 3/ layer.
Subfile: A

18/3,AB/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

5448525 INSPEC Abstract Number: A9702-6180F-004
Title: Electron irradiation damage in quartz, SiO/sub 2/
Author(s): Martin, B.; Florke, O.W.; Kainka, E.; Wirth, R.
Author Affiliation: Inst. fuer Miner., Bochum Univ., Germany
Journal: Physics and Chemistry of Minerals vol.23, no.7 p.409-17
Publisher: Springer-Verlag,
Publication Date: Oct. 1996 Country of Publication: Germany
CODEN: PCMIDU ISSN: 0342-1791
SICI: 0342-1791(199610)23:7L.409:EIDQ;1-T
Material Identity Number: P275-96007
Language: English
Abstract: Crystallographically orientated samples of synthetic optical-grade colourless quartz with high chemical purity and low dislocation density together with synthetic gem-grade amethyst with high Fe-concentration and ca. 250 H/10/sup 6/ Si ("dry") or 600 H/10/sup 6/ Si ("wet") and with very high dislocation densities were irradiated using TEM.

Samples of cuts **perpendicular** (<c>-cuts) and parallel (<X>-cuts) to the c-axis, that were as-grown or pretreated for 5 days at 820 K on air or under p(H/sub 2/O)=10/sup 8/ Pa were prepared. Characterization methods used include AAS, FTIR, Raman-spectroscopy, X-ray-topography, REM, TEM in SAED and bright-field mode and polarized light microscopy. Radiolysis was carried out in TEM from 10 to 300 K with 100 kV and from 70-850 K (low-high-transition temperature of quartz) with 200 kV. Irradiation damage was investigated by decay of Kikuchi-lines or of Bragg-reflections in SAED and in bright-field mode by development of strain contrast centres and of noncrystalline volume areas. Special preparates where the irradiation damage was of microscopic dimensions were investigated using Raman-spectroscopy. Radiolysis of quartz is able to proceed at 10 K with measurable velocity. The required electron dose for a standardized irradiation damage decreases with increasing temperature. At ca. 500 K it goes through a minimum and then increases steadily up to ca. 700 K. From there the increase is steep until ca. 820 K where it culminates sharply, showing strong fluctuations until 850 K.

Subfile: A

18/3,AB/3 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

5232844 INSPEC Abstract Number: A9609-8140L-074

Title: Electron microscopy on a long-fibre reinforced aluminium alloy

Author(s): Prantl, W.; Stadlober, T.; Werner, E.

Author Affiliation: Inst. fur Metallkunde & Werkstoffprufung, Montanuniv. Leoben, Austria

Journal: Zeitschrift fur Metallkunde vol.86, no.12 p.839-44

Publisher: Carl Hanser Verlag,

Publication Date: Dec. 1995 Country of Publication: West Germany

CODEN: ZEMTAE ISSN: 0044-3093

SICI: 0044-3093(199512)86:12L.839:EMLF;1-9

Material Identity Number: Z021-96003

Language: German

Abstract: An aluminium composite with directionally embedded ceramic long fibres was investigated in the transmission electron microscope. Specimens were deformed in tension with different loads in directions **perpendicular** to the fibres with the aim to study the influence of a mechanical deformation on the microstructure of the composite. The microstructural features were investigated with respect to their dimensions and crystallographical orientations using electron diffraction techniques. The results reveal valuable data for the micromechanical modelling of the transverse mechanical properties of the composite.

27/3,AB/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

7236359 INSPEC Abstract Number: A2002-10-8115C-017, B2002-05-0520B-018
Title: Growth mechanism of reactively sputtered aluminum nitride thin films
Author(s): Bing-Hwai Hwang; Chi-Shan Chen; Hong-Yang Lu; Tzu-Chien Hsu
Author Affiliation: Inst. of Mater. Sci. & Eng., Nat. Sun Yat-Sen Univ., Kaohsiung, Taiwan
Journal: Materials Science & Engineering A (Structural Materials: Properties, Microstructure and Processing) vol.A325, no.1-2 p.380-8
Publisher: Elsevier,
Publication Date: 28 Feb. 2002 Country of Publication: Switzerland
CODEN: MSAPE3 ISSN: 0921-5093
SICI: 0921-5093(20020228)A325:1/2L.380:GMRS;1-2
Material Identity Number: M711-2002-006
U.S. Copyright Clearance Center Code: 0921-5093/02/$22.00
Language: English
Abstract: Aluminum nitride (AlN) thin films grown on Si (100) by radio frequency sputtering have been analyzed by X-ray diffractometry, scanning electron microscopy and transmission electron microscopy (TEM). Films ~3 mu m thick exhibit the [0001] preferred growth direction where columnar AlN crystals are grown in a non-epitaxial pattern and aligned almost **perpendicular** to the SiO/sub 2/-Si substrate surface. Detailed microstructual analysis from the cross-section TEM of the thin films reveals three areas including the Si substrate (layer (a)), the SiO/sub 2/ (layer (b)), and the AlN film (layer (c)-(f)). The deposited AlN film appears to consist of four distinct layers characterized by their crystalline phases and grain crystallographic orientations. These include the (c) reaction, (d) transition, (e) alignment, and (f) surface layers. The reaction layer (c) is composed of alpha -**Al**/sub 2/**O**/sub 3/ precipitates in an amorphous matrix. Randomly oriented AlN grains start to form in the lower end and become better aligned towards the upper end of the transition layer (d). In **layer** (e), well-**aligned** AlN grains have developed to form distinct columnar structure, which continues to grow in size in the surface layer (f). The microstructural observation has enabled us to propose a growth mechanism involving the influence from alpha -**Al**/sub 2/**O**/sub 3/.
Subfile: A B

27/3,AB/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC

7195715 INSPEC Abstract Number: A2002-07-8115I-028, B2002-04-0520H-017
Title: Influence of substrate temperature on barium ferrite films prepared by laser deposition
Author(s): Song, W.D.; Lu, Y.F.; Wang, W.J.; Chong, T.C.
Author Affiliation: Laser Microprocess. Lab., Data Storage Inst., Singapore
Conference Title: Laser-Solid Interactions for Materials Processing, Symposium (Materials Research Society Symposium Proceedings Vol.617) p. J3.10.1-6
Editor(s): Kumar, D.; Norton, D.P.; Lee, C.B.; Ebihara, K.; Xi, X.X.
Publisher: Mater. Res. Soc, Warrendale, PA, USA

Publication Date: 2000 Country of Publication: USA xi+256 pp.
ISBN: 1 55899 525 0 Material Identity Number: XX-2001-01014
Conference Title: Laser-Solid Interactions for Materials Processing. Symposium
Conference Date: 25-27 April 2000 Conference Location: San Francisco, CA, USA
Language: English
Abstract: Influence of substrate temperature on properties of barium ferrite films prepared by laser deposition is studied in this paper. The magnetic properties, grain shape and crystalline **orientation** of the **films** are discussed for the films prepared by laser deposition with in-situ heating, post annealing and varying substrate temperature. The results show that magnetic properties, grain shape and crystalline **orientation** of the **film** deposited with varying substrate temperature are close to the film deposited with post annealing and different to the film deposited with in situ heating.
Subfile: A B

27/3,AB/3 (Item 3 from file: 2)
DIALOG(R)File 2:INSPEC

6842853 INSPEC Abstract Number: A2001-06-8115I-012
Title: Sr-ferrite thin films grown on **sapphire** by pulsed laser deposition
Author(s): Koleva, M.E.; Zotova, S.; Atanasov, P.A.; Tomov, R.I.; Ristoscu, C.; Nelea, V.; Chiritescu, C.; Gyorgy, E.; Ghica, C.; Mihailescu, I.N.
Author Affiliation: Inst. of Electron., Sofia, Bulgaria
Journal: Applied Surface Science Conference Title: Appl. Surf. Sci. (Netherlands) vol.168 p.108-13
Publisher: Elsevier,
Publication Date: 15 Dec. 2000 Country of Publication: Netherlands
CODEN: ASUSEE ISSN: 0169-4332
SICI: 0169-4332(20001215)168L.108:FTFG;1-Q
Material Identity Number: I974-2001-001
U.S. Copyright Clearance Center Code: 0169-4332/2000/$20.00
Conference Title: EMRS 2000 Spring Meeting, Symposium D: Photon-Induced Material Processing
Conference Date: 30 May-2 June 2000 Conference Location: Strasbourg, France
Language: English
Abstract: High-quality epitaxial strontium-hexaferrite (SrFe/sub 12/O/sub 19/) thin films were grown by pulsed laser deposition (PLD) on c-cut **sapphire** using KrF* excimer laser at a fluency of 2 J/cm/sup 2/ and substrate temperature of 800 degrees C in 100 mTorr oxygen environment. The X-ray diffraction (XRD) and morphology analyzes showed films with excellent crystalline structure and flat surface. The thickness was found to influence considerably the surface morphology and magnetic properties of the as deposited **films**. The highest **orientation** and the best morphology with smooth surface and fine grain structure was obtained for the film having a thickness of 750 nm. The highest coercive force of 1453 Oe was measured for this film in **perpendicular** to the plane direction.
Subfile: A

27/3,AB/4 (Item 4 from file: 2)
DIALOG(R)File 2:INSPEC

6574087 INSPEC Abstract Number: A2000-11-8115H-037, B2000-06-0520F-042
Title: Orientation control of ZnO thin film prepared by CVD
Author(s): Funakubo, H.; Mizutani, N.; Yonetsu, M.; Saiki, A.; Skinozaki, K.
Author Affiliation: Dept. of Inorg. Mater., Tokyo Inst. of Technol., Japan
Journal: Journal of Electroceramics Conference Title: J. Electroceram. (Netherlands) vol.4, suppl., no.1 p.25-32
Publisher: Kluwer Academic Publishers,
Publication Date: Dec. 1999 Country of Publication: Netherlands
CODEN: JOELFJ ISSN: 1385-3449
SICI: 1385-3449(199912)4:1L.25:OCTF;1-8
Material Identity Number: F387-2000-003
U.S. Copyright Clearance Center Code: 1385-3449/99/$9.50
Conference Title: Workshop on Functional Interface in Ceramic Materials (Frontier Ceramics)
Conference Date: 13-14 March 1997 Conference Location: Tsukuba, Japan
Language: English
Abstract: The **orientations** of ZnO **films** parallel and **perpendicular** to the surface of the substrate were investigated as functions of the deposition temperature and substrate material. The degree of orientation increased with increasing deposition temperature and became perfectly oriented at a characteristic temperature. At a deposition temperature of 620 degrees C, polycrystalline films were obtained on polycrystalline **Al**/sub 2/**O** /sub 3/ substrates. (001) oriented films were obtained on fused silica and (100) rutile substrates. Epitaxially grown (110) and (001) oriented films were obtained on various kinds of single crystal substrates. The difference between the (110) and (001) orientations was explained by the lattice mismatch between the films and the substrates. Epitaxial growth of films exhibiting two directions was observed when the two equivalent directions of lattice mismatch existed. These results show the possible formation of various types of the crystallographic relationships between the grains in the film.
Subfile: A B

27/3,AB/5 (Item 5 from file: 2)
DIALOG(R)File 2:INSPEC

6328116 INSPEC Abstract Number: A1999-19-6855-026
Title: X-ray diffraction and Rutherford backscattering spectrometry of Ba/sub 1/Nb/sub x/Ti/sub 1-x/O/sub 3/ thin films synthesized by laser ablation
Author(s): Nasir Khan, M.; Hyun-Tak Kim; Kusawake, T.; Ohshima, K.; Uwe, H.
Author Affiliation: Inst. of Appl. Phys., Tsukuba Univ., Ibaraki, Japan
Journal: Journal of Applied Physics vol.86, no.4 p.2307-10
Publisher: AIP,
Publication Date: 15 Aug. 1999 Country of Publication: USA
CODEN: JAPIAU ISSN: 0021-8979
SICI: 0021-8979(19990815)86:4L.2307:DRBS;1-T
Material Identity Number: J004-1999-015

U.S. Copyright Clearance Center Code: 0021-8979/99/86(4)/2307(4)/$15.00
Language: English
Abstract: Niobium doped barium titanate Ba/sub 1/Nb/sub x/Ti/sub 1-x/O/sub 3/ thin films have been successfully synthesized by laser ablation on **sapphire** (0001) and (100) SrTiO/sub 3/ substrates, for the growth of hexagonal and cubic phases of this system. These films were synthesized with different concentrations of niobium under various conditions. X-ray diffraction measurements showed that the **films** were well **aligned** along the c-axis of the **sapphire** substrate for the hexagonal phase, while **perpendicular** to the SrTiO/sub 3/ substrate surface for the cubic phase of this system. These films were deposited at substrate temperatures of 700 and 650 degrees C for the hexagonal and cubic phases, respectively, both in oxygen and nitrogen atmospheres. At room temperature these films have a very high resistance and large negative thermopower approximately=300 mV/K. Rutherford backscattering spectrometry (RBS) was performed on very thin films of this system for different concentrations of niobium deposited in the N/sub 2/ atmosphere. We have found a deficiency of Ti in these films by RBS analysis, which along with other antisite defects and oxygen deficiency, may be a cause of high resistance and large thermopower in these films.
Subfile: A

27/3,AB/6 (Item 6 from file: 2)
DIALOG(R)File 2:INSPEC

6228142 INSPEC Abstract Number: A1999-11-6855-005, B1999-06-0520H-005
Title: Growth and structural study of Pb(Zr/sub 0.52/Ti/sub 0.48/)O/sub 3/-based laser ablation deposited epitaxial thin films and heterostructures on SrTiO/sub 3/ and **Al**/sub 2/**O**/sub 3/ substrates
Author(s): Le Marree, F.; Marechal, C.; Steinseth, R.K.; Karkut, M.G.
Author Affiliation: Lab. de Phys. de la Matiere Condensee, Univ. de Picardie Jules Vernes, Amiens, France
Journal: Vide Science, Technique et Applications vol.53, no.289 p. 601-6
Publisher: Soc. Francaise du Vide,
Publication Date: 1998 Country of Publication: France
CODEN: VSTAFH ISSN: 1266-0167
SICI: 1266-0167(1998)53:289L.601:GSS5;1-2
Material Identity Number: D420-1999-003
Language: English
Abstract: We have successfully grown in situ, by laser ablation, thin films and two different heterostuctures based on PZT: 1. Pb(Zr/sub 0.52/Ti/sub 0.48/)O/sub 3//(100)SrTiO/sub 3/ (PZT/STO), 2. Pb(Zr/sub 0.52/Ti/sub 0.48/)O/sub 3//YBa/sub 2/CuO/sub 7//CeO/sub 2//(1102)**Al**/sub 2/**O**/sub 3/ (PZT/YBCO/CeO/sub 2//**Al**/sub 2/**O**/sub 3/), and 3. Pb(Zr/sub 0.52/Ti/sub 0.48/)O/sub 3//YBa/sub 2/Cu/sub 3/O/sub 7//(100)SrTiO/sub 3/ (PZT/YBCO/STO). CeO/sub 2/ is used as a buffer layer and YBCO as a bottom electrode. By combining RHEED (reflection high energy electron diffraction) and X-ray diffraction we have determined that: (a) all the buffer and electrode layers are atomically flat, (b) PZT grows in the 2D to 3D Stransky-Krastanov mode, (c) there is an epitaxial relationship between the in-plane axes of the layers and the substrates, and (d) the c-axis of PZT is **perpendicular** to the plane of the film.
Subfile: A B

27/3,AB/7 (Item 7 from file: 2)
DIALOG(R)File 2:INSPEC

5814115 INSPEC Abstract Number: A9805-8115H-018
Title: Deposition of BaFe/sub 12/O/sub 19/ thin films by a new injection-CVD method
Author(s): Pignard, S.; Senateur, J.P.; Vincent, H.; Kreisel, J.; Abrutis, A.
Author Affiliation: L.M.G.P., E.N.S. de Physique de Grenoble, Saint-Martin d'Heres, France
Journal: Journal de Physique IV (Colloque) vol.7, no.C1 p.483-4
Publisher: Editions de Physique,
Publication Date: March 1997 Country of Publication: France
CODEN: JPICEI ISSN: 1155-4339
SICI: 1155-4339(199703)7:C1L.483:DBTF;1-V
Material Identity Number: O739-97005
Language: English
Abstract: A new process of injection-MOCVD has been used to synthesize barium hexaferrite thin films on **Al**/sub 2/**O**/sub 3/ (0001) substrates. This new technique uses a liquid source of precursors dissolved in a convenient solvent. X-ray diffraction measurements have been performed to observe thin films lattices with respect to the orientation of the substrate:hexaferrite film epitaxy is observed with c-axis **perpendicular** to the substrate. Magnetic measurements have been performed in the plane and **perpendicular** to the film plane:they confirm the preferential **orientation** of **films**.
Subfile: A

27/3,AB/8 (Item 8 from file: 2)
DIALOG(R)File 2:INSPEC

5725502 INSPEC Abstract Number: A9723-8115I-002
Title: Reactive pulsed laser deposition: a tool for obtaining high-quality piezoelectric thin films
Author(s): Dinescu, M.; Verardi, P.; Craciun, F.
Author Affiliation: Laser Dept., Inst. of Atomic Phys., Bucharest, Romania
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.3093 p.249-55
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 1997 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1997)3093L.249:RPLD;1-0
Material Identity Number: C574-97137
U.S. Copyright Clearance Center Code: 0277-786X/97/$10.00
Conference Title: Nonresonant Laser-Matter Interaction (NLMI-9)
Conference Sponsor: SPIE; Ministry of Sci. & Technical Policy of the Russian Federation; Russian Found. Basic Res.; et al
Conference Date: 1-3 July 1996 Conference Location: St. Petersburg-Pushkin, Russia
Language: English
Abstract: High quality ZnO, AlN, PZT thin films were deposited on different substrates (Si, **sapphire**, Corning glass) by the reactive

pulsed laser deposition technique using a Nd-YAG laser (lambda equals 1.06 micrometer, t/sub FWHM/ equals 10 ns, 0.3 J/pulse) as laser source. The depositions were performed in a stainless steel vacuum chamber (base pressure less than 10/sup -6/ mbar) as follows: (1) Zn and PZT targets in high purity oxygen atmosphere, (2) Al target in ultrahigh purity nitrogen reactive atmosphere. Low collector temperatures (in the range of 0-350 degrees Celsius), high distance target collector (4-7 cm), high laser intensities, reactive gas pressure in the range of 10/sup -3/-10/sup -1/ mbar were found to be mandatory requirements for obtaining uniform, appropriate crystalline **orientation** thin **films**, with thickness in the range of 2-4 micrometer. Typical analysis as: X-ray diffraction, cross section SEM, X-ray photoelectron spectroscopy (XPS), Fourier transmission infrared spectroscopy (FTIR), secondary ion mass spectroscopy (SIMS), optical absorption spectroscopy were used to characterize the deposited films. They evidence the stoichiometric composition, crystalline structure with the c-axis **perpendicular** to substrate surface, columnar structure, etc. For the piezoelectric properties studies special structures were prepared: substrate (Si, etc.)/Cr(100 angstrom)/Au(1000 angstrom)/ZnO(or AlN, or PZT)/Al in order to configure an electroacoustic transducer for bulk acoustic wave generation and detection. The measurements confirm the good properties of the deposited films.

Subfile: A

27/3,AB/9 (Item 9 from file: 2)

DIALOG(R)File 2:INSPEC

5673030 INSPEC Abstract Number: A9719-7340Q-004, B9710-2530F-010

Title: Preparation of piezoelectric-coefficient modulated multilayer film ZnO/**Al**/sub 2/**O**/sub 3/ and its ultrahigh frequency resonance

Author(s): Hu, W.S.; Liu, Z.G.; Wu, R.X.; Chen, Y.-F.; Ji, W.; Yu, T.; Feng, D.

Author Affiliation: Lab. of Solid State Microstructures, Nanjing Univ., China

Journal: Applied Physics Letters vol.71, no.4 p.548-50

Publisher: AIP,

Publication Date: 28 July 1997 Country of Publication: USA

CODEN: APPLAB ISSN: 0003-6951

SICI: 0003-6951(19970728)71:4L.548:PPCM;1-C

Material Identity Number: A135-97034

U.S. Copyright Clearance Center Code: 0003-6951/97/71(4)/548/3/$10.00

Language: English

Abstract: Multilayer films composed of piezoelectrically active ZnO and inactive **Al**/sub 2/**O**/sub 3/ layers, were prepared on silicon by pulsed laser deposition technique. The ZnO layers were completely (001) textured to generate a single piezoelectric coefficient d/sub 33/ **perpendicular** to the substrate surface and the **Al**/sub 2/**O** /sub 3/ layers were amorphous at 375 degrees C. The interfacial sharpness and the **film orientation** were analyzed by low and high angle X-ray diffraction theta -2 theta scanning. High frequency resonance of 10.6 GHz was measured and higher value up to 100 GHz is expected in the multilayer films with the period 320 nm or smaller.

Subfile: A B

27/3,AB/10 (Item 10 from file: 2)

DIALOG(R)File 2:INSPEC

5281933 INSPEC Abstract Number: A9613-6810-008
Title: Systematic study of orientational wetting and anchoring at a liquid-crystal-surfactant interface
Author(s): Crawford, G.P.; Ondris-Crawford, R.J.; Doane, J.W.; Zumer, S.
Author Affiliation: Liquid Crystal Inst., Kent State Univ., OH, USA
Journal: Physical Review E (Statistical Physics, Plasmas, Fluids, and Related Interdisciplinary Topics) vol.53, no.4, pt.B p.3647-61
Publisher: APS through AIP,
Publication Date: April 1996 Country of Publication: USA
CODEN: PLEEE8 ISSN: 1063-651X
SICI: 1063-651X(199604)53:4:BL.3647:SSOW;1-0
Material Identity Number: A367-96008
U.S. Copyright Clearance Center Code: 1063-651X/96/53(4)/3647(15)/$10.00
Language: English
Abstract: The molecular anchoring and orientational wetting properties of a liquid crystal close to the nematic-isotropic transition temperature confined to the 0.2 mu m cylindrical channels of **alumina** membranes are investigated for various surface preparations. The cavity walls of the confining pores are chemically modified with an aliphatic acid (C/sub n/H/sub 2n+1/-COOH) to establish surface anchoring. Radical changes in deuterium nuclear magnetic resonance (/sup 2/H-NMR) line shapes in the nematic phase reveal the existence of a discontinuous **homeotropic** -to-planar anchoring transition that is induced by either changing the length of the surfactant (vary carbon number n), the density of the surfactant on the surface (vary concentration), or by varying temperature. The transition to planar anchoring drives the planar-polar nematic director field to a stable uniform axial structure. Above the nematic-isotropic transition temperature, the thickness of the surfactant monolayer is found to strongly influence the degree of the surface-induced orientational ordering. The corresponding order parameter of the liquid-crystal molecules at the surfactant interface increases as n increases, until a maximum ordering surface (n=17) is reached; thereafter, the surface order parameter decreases as n increases. An orientational wetting transition from partial to quasicomplete is observed as the length of the aliphatic acid increases. The effect is manifested in the change of the pretransitional temperature dependence of the adsorption parameter from weak to strong but still nondivergent. Further increase in n results in a reentrant phenomenon back to the partial wetting regime. Similar coupling mechanisms and wetting behaviors exhibited by the long chain aliphatic acids and the more rigid benzoic acid surfactants indicate minimal interdigitation of the liquid-crystal molecules into the surfactant **aligning layer**.
Subfile: A

27/3,AB/11 (Item 11 from file: 2)
DIALOG(R)File 2:INSPEC

4732013 INSPEC Abstract Number: A9418-6130-010
Title: Planar XY-model dynamics in a nematic liquid crystal system
Author(s): Pargellis, A.N.; Green, L.S.; Yurke, B.
Author Affiliation: AT&T Bell Labs., Murray Hill, NJ, USA
Journal: Physical Review E (Statistical Physics, Plasmas, Fluids, and Related Interdisciplinary Topics) vol.49, no.5, pt.A p.4250-7
Publication Date: May 1994 Country of Publication: USA

CODEN: PLEEE8 ISSN: 1063-651X
U.S. Copyright Clearance Center Code: 1063-651X/94/49(5)/4250(8)/$06.00
Language: English
Abstract: We have constructed a nematic liquid crystal system that exhibits the dynamics of a two-dimensional XY-model. The system consists of liquid crystal material placed between two **sapphire** windows **coated** with **homeotropic alignment** material. By holding the windows at two different temperatures, a thermal gradient can be maintained across the liquid crystal material such that the nematic-to-isotropic interface occurs at the center of the cell in a plane parallel to the two window surfaces. The boundary conditions that the interface and one of the windows impose on the nematic phase force the system's degrees of freedom to be those of the XY model. Comparison between experiment and numerical simulations indicate the system exhibits planar XY-model behavior.
Subfile: A

27/3,AB/12 (Item 12 from file: 2)
DIALOG(R)File 2:INSPEC

4414753 INSPEC Abstract Number: A9313-7865-025
Title: Raman scattering and X-ray diffractometry studies of epitaxial TiO/sub 2/ and VO/sub 2/ thin films and multilayers on alpha -**Al**/sub 2/**O**/sub 3/(1120)
Author(s): Foster, C.M.; Chiarello, R.P.; Chang, H.L.M.; You, H.; Zhang, T.J.; Frase, H.; Parker, J.C.; Lam, D.J.
Author Affiliation: Mater. Sci. Div., Argonne Nat. Lab., IL, USA
Journal: Journal of Applied Physics vol.73, no.6 p.2841-7
Publication Date: 15 March 1993 Country of Publication: USA
CODEN: JAPIAU ISSN: 0021-8979
U.S. Copyright Clearance Center Code: 0021-8979/93/062841-07$06.00
Language: English
Abstract: Epitaxial thin films of TiO/sub 2/ and VO/sub 2/ single layers and TiO/sub 2//VO/sub 2/ multilayers were grown on (1120) **sapphire** (alpha -**Al**/sub 2/**O** /sub 3/) substrates using the metalorganic chemical vapor deposition technique and were characterized using Raman scattering and four-circle X-ray diffractometry. X-ray diffraction results indicate that the films are high quality single crystal material with well defined growth plane and small in-plane and out-of-plane mosaic. Single-layer films are shown to obey the Raman selection rules of TiO/sub 2/ and VO/sub 2/ single crystals. The close adherence to the Raman selection rules indicates the high degree of **orientation** of the **films**, both parallel and **perpendicular** to the growth plane. Selection rule spectra of two and three layer TiO/sub 2//VO/sub 2/ multilayers are dominated by the VO/sub 2/ layers with only minimal signature of the TiO/sub 2/ layers. Due to the low band gap of semiconducting vanadium dioxide, the authors attribute the strong signature of the VO/sub 2/ layers to resonant enhancement of the VO/sub 2/ Raman component accompanied with absorption of the both the incident and scattered laser light from the TiO/sub 2/ layers.
Subfile: A

27/3,AB/13 (Item 13 from file: 2)
DIALOG(R)File 2:INSPEC

04093450 INSPEC Abstract Number: A9207-8115C-003
Title: Preparation and structural characterization of sputtered CoO, NiO, and Ni/sub 0.5/Co/sub 0.5/O thin epitaxial films
Author(s): Carey, M.J.; Spada, F.E.; Berkowitz, A.E.; Cao, W.; Thomas, G.
Author Affiliation: Dept. of Phys., California Univ., San Diego, La Jolla, CA, USA
Journal: Journal of Materials Research vol.6, no.12 p.2680-7
Publication Date: Dec. 1991 Country of Publication: USA
CODEN: JMREEE ISSN: 0884-2914
Language: English
Abstract: Single phase CoO, NiO, and Ni/sub 0.5/Co/sub 0.5/O epitaxial films have been prepared by reactive sputtering onto (0001) alpha -**Al** /sub 2/O/sub 3/ substrates maintained at 373 K. Epitaxy was confirmed by X-ray diffraction (XRD) and high resolution electron microscopy (HREM) techniques. XRD experiments indicate that these monoxide films are cubic and contain rotation twins with the twin axis parallel to (111). Lattice parameters for the CoO and NiO films are 0.4254+or-0.0001 nm and 0.4173+or-0.0006 nm, respectively, and agree with published values for the corresponding bulk oxides. The lattice parameter 0.4220+or-0.0001 nm for the Ni/sub 0.5/Co/sub 0.5/O film lies between those of CoO and NiO and suggests that the mixed oxide film is compositionally homogeneous. Cross-sectional HREM images of the Ni/sub 0.5/Co/sub 0.5/O specimen show Sigma 3(112) twin boundaries **perpendicular** to the oxide-substrate interface. The twin regions are approximately 30 nm in size and are uniformly distributed throughout the **film**. The epitaxial **orientation** of the monoxide films with respect to the substrate can be summarized by the relationships (111) monoxide//(0001) alpha -**Al** /sub 2/**O**/sub 3/, (110) monoxide//(1100) alpha -**Al**/sub 2/**O** /sub 3/, and (112) monoxide//(1120) alpha -**Al**/sub 2/**O**/sub 3/.
Subfile: A

27/3,AB/14 (Item 14 from file: 2)
DIALOG(R)File 2:INSPEC

03948895 INSPEC Abstract Number: A91111403
Title: Bi-Sr-Ca-Cu-O film on **sapphire** grown by plasma-enhanced halide CVD
Author(s): Kimura, T.; Nakao, H.; Yamawaki, H.; Ihara, M.; Ozeki, M.
Author Affiliation: Fujitsu Lab. Ltd., Atsugi, Japan
Journal: IEEE Transactions on Magnetics vol.27, no.2, pt.2 p. 1211-14
Publication Date: March 1991 Country of Publication: USA
CODEN: IEMGAQ ISSN: 0018-9464
U.S. Copyright Clearance Center Code: 0018-9464/91/0300-1211$01.00
Conference Title: 1990 Applied Superconductivity Conference
Conference Sponsor: IEEE
Conference Date: 24-28 Sept. 1990 Conference Location: Snowmass, CO, USA
Language: English
Abstract: Plasma-enhanced halide chemical vapor deposition (CVD) for Bi-Sr-Ca-Cu-O (BSCCO) thin film has been developed. Superconducting BSCCO films were fabricated on 3-in-diameter **sapphire** substrates without postannealing. The CVD apparatus has four source-gas generation cells in which source materials (BiCl/sub 3/, SrI/sub 2/, CaI/sub 2/, and CuI) are evaporated or sublimated by heaters. Source gases are carried to the deposition chamber with helium. Oxidizing gases are O/sub 2/ and/or H/sub 2/O. The total pressure in the deposition chamber was 0.1 torr, and the

O/sub 2/ partial pressure was 0.01 torr. Deposition was at 2 AA/min. It was found that the superconducting BSCCO film could be deposited on **sapphire** substrates at less than 700 degrees C without a solid-phase reaction between the film and substrate and that plasma-enhanced CVD controlled the BSCCO phases even at 580 degrees C. RF-plasma enhancement resulted in as-deposited superconducting BSCCO films. The c-axis **orientation** of the **films** was **perpendicular** to the **sapphire** 's (1102)-plane. The 700-AA-thick (2212)-phase BSCCO film showed that the resistive transition started at about 100 K and that the zero-resistivity temperature was 70 K. The critical current density was about 2.5*10/sup 6/ A/cm/sup 2/ at 10 K.
Subfile: A

27/3,AB/15 (Item 15 from file: 2)
DIALOG(R)File 2:INSPEC

03639731 INSPEC Abstract Number: A90083276
Title: In-situ growth of superconducting YBa/sub 2/Cu/sub 3/O/sub y/ films by pulsed laser deposition
Author(s): Boyce, J.B.; Connell, G.A.N.; Fork, D.K.; Fenner, D.B.; Char, K.; Ponce, F.A.; Bridges, F.; Tramontana, J.; Viano, A.M.; Laderman, S.S.; Taber, R.C.; Tahara, S.; Geballe, T.H.
Author Affiliation: Xerox Palo Alto Res. Center, CA, USA
Journal: Proceedings of the SPIE - The International Society for Optical Engineering vol.1187 p.136-47
Publication Date: 1990 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
Language: English
Abstract: YBa/sub 2/Cu/sub 3/O/sub y/ thin films have been deposited in-situ on several substrate materials using pulsed excimer laser deposition. On the substrates, SrTiO/sub 3/, MgO, LaAlO/sub 3/, and yttrium-stabilized zirconia (YSZ), excellent films were obtained. These films had high superconducting transition temperatures (91 K) with narrow transition widths (approximately=0.5 K), metallic conductivity in the normal state, low room-temperature resistivity (approximately=250 mu Omega -cm), high critical currents (approximately=3*10/sup 7/ A/cm/sup 2/ at 4.2 K), c-axis orientation **perpendicular** to the plane of the **film**, and epitaxial **alignment** with the substrate. On the more technologically relevant substrates of **Al**/sub 2/**O**/sub 3/ and Si, less optimal results were obtained. The transition temperatures were high (86-8 K) and metallic conductivity was obtained in the normal state. However, the room-temperature and microwave surface resistivities were higher and the critical currents were lower than for the above benchmark substrates.
Subfile: A

27/3,AB/16 (Item 16 from file: 2)
DIALOG(R)File 2:INSPEC

02267709 INSPEC Abstract Number: A84071458
Title: Brillouin scattering from thermal magnons in a thin Co film
Author(s): Vernon, S.P.; Lindsay, S.M.; Stearns, M.B.
Author Affiliation: Dept. of Phys., Arizona State Univ., Tempe, AZ, USA
Journal: Physical Review B (Condensed Matter) vol.29, no.8 p. 4439-42

Publication Date: 15 April 1984 Country of Publication: USA
CODEN: PRBMDO ISSN: 0163-1829
Language: English

Abstract: The authors report a room-temperature Brillouin scattering study of surface and standing spin-wave modes in a 100-nm film of polycrystalline HCP cobalt. The film was prepared by vapor deposition of Co metal onto a single-crystal **sapphire** substrate with the crystalline c axis in the substrate plane. X-ray measurements show the **film** is predominantly **aligned** with the (001) axis normal to the film plane. Measurements were made with a five-pass plus four-pass tandem vernier Fabry-Perot interferometer with an instrumental full width of 700 MHz. The magnetic field H/sub 0/, 150<or=H/sub 0/<or=3500 Oe, was applied in the plane of the film, **perpendicular** to the scattering plane. Fitting the theoretical expressions for surface and standing spin-wave dispersion relations to the experimentally determined frequency shift versus applied field gives values for the gyromagnetic ratio and saturation magnetization in satisfactory agreement with literature values obtained from the application of other experimental techniques. However, the exchange stiffness constant D obtained from analysis of the light scattering measurements is significantly smaller than that deduced from both neutron scattering and magnetization measurements.

Subfile: A

27/3,AB/17 (Item 1 from file: 103)
DIALOG(R)File 103:Energy SciTec

04216543 AIP-97-140108; EDB-97-125247
Title: Preparation of piezoelectric-coefficient modulated multilayer film ZnO/**Al**[sub 2]**O**[sub 3] and its ultrahigh frequency resonance
Author(s): Hu, W.S.; Liu, Z.G. (National Laboratory of Solid State Microstructures, Nanjing University, Nanjing 210093, Peoples Republic of (China)); Wu, R.X. (Department of Electronic Science and Engineering, Nanjing University, Nanjing 210093, Peoples Republic of (China)); Chen, Y.; Ji, W.; Yu, T.; Feng, D. (National Laboratory of Solid State Microstructures, Nanjing University, Nanjing 210093, Peoples Republic of (China))
Source: Applied Physics Letters v 71:4. Coden: APPLAB ISSN: 0003-6951
Publication Date: Jul 1997
p 548-550
Language: English
Abstract: Multilayer films composed of piezoelectrically active ZnO and inactive **Al**[sub 2]**O**[sub 3] layers were prepared on silicon by a pulsed laser deposition technique. The ZnO layers were completely (001) textured to generate a single piezoelectric coefficient d[sub 33] **perpendicular** to the substrate surface and the **Al**[sub 2] O[sub 3] layers were amorphous at 375[degree]C. The interfacial sharpness and the **film orientation** were analyzed by low and high angle x-ray diffraction [theta][endash]2[theta] scanning. High frequency resonance of 10.6 GHz was measured and higher values up to 100 GHz are expected in the multilayer films with periods 320 nm or smaller. [copyright] [ital 1997 American Institute of Physics.]

27/3,AB/18 (Item 2 from file: 103)
DIALOG(R)File 103:Energy SciTec

03452484 AIP-93-040012; EDB-93-031360
Title: Raman scattering and x-ray diffractometry studies of epitaxial TiO[sub 2] and VO[sub 2] thin films and multilayers on [alpha]-**Al**[sub 2]**O**[sub 3](11[bar 2]0)
Author(s): Foster, C.M.; Chiarello, R.P.; Chang, H.L.M.; You, H.; Zhang, T.J.; Frase, H.; Parker, J.C.; Lam, D.J. (Materials Science Division, Argonne National Laboratory, 9700 S. Cass Avenue, Argonne, Illinois 60439 (United States))
Source: Journal of Applied Physics (United States) v 73:6. Coden: JAPIAU
ISSN: 0021-8979
Publication Date: 15 Mar 1993
p 2841-2847
Contract Number (DOE): W-31-109-ENG-38
Language: English
Abstract: Epitaxial thin films of TiO[sub 2] and VO[sub 2] single layers and TiO[sub 2]/VO[sub 2] multilayers were grown on (11[bar 2]0) **sapphire** ([alpha]-**Al**[sub 2]**O**[sub 3]) substrates using the metalorganic chemical vapor deposition technique and were characterized using Raman scattering and four-circle x-ray diffractometry. X-ray diffraction results indicate that the films are high quality single crystal material with well defined growth plane and small in-plane and out-of-plane mosaic. Single-layer films are shown to obey the Raman selection rules of TiO[sub 2] and VO[sub 2] single crystals. The close adherence to the Raman selection rules indicates the high degree of **orientation** of the **films**, both parallel and **perpendicular** to the growth plane. Selection rule spectra of two and three layer TiO[sub 2]/VO[sub 2] multilayers are dominated by the VO[sub 2] layers with only minimal signature of the TiO[sub 2] layers. Due to the low band gap of semiconducting vanadium dioxide, we attribute the strong signature of the VO[sub 2] layers to resonant enhancement of the VO[sub 2] Raman component accompanied with absorption of the both the incident and scattered laser light from the TiO[sub 2] layers.

27/3,AB/19 (Item 3 from file: 103)
DIALOG(R)File 103:Energy SciTec

03315118 NEDO-91-914853; EDB-92-088762
Title: Effects of surface **coating** and **orientation** of whiskers on mechanical properties of SiC(w) Si sub 3 N sub 4
Original Title: SiC(w) Si sub 3 N sub 4 no kyodo oyobi jisei ni oyobosuwhiskers hyomen hifuku to haiko no koka
Author(s): Matsui, T.; Komura, O.; Miyake, M. (Sumitomo Electric Industries Ltd., Osaka (Japan))
Source: Nippon Seramikkusu Kyokai Gakujutsu Ronbunshi (Journal of the Ceramic Society of Japan) (Japan) v 99. Coden: NSKRE ISSN: 0914-5400
Publication Date: 1 Nov 1991
p 1103-1109
Language: In Japanese
Abstract: Si {sub 3} N {sub 4} ceramics which have excellent abrasion resistance, corrosion resistence as well as thermal shock resistance are expected to be used as structure materials of automobile parts and mechanical parts. However, since it can not be said yet that the fracture toughness and high temperature strength are suffient for being used as utility material, the researches of aiming at high strengh and high toughness by compounding whiskers and long fibers are carried on

actively. In this paper, the following results were obtained from examining the effects of surface coating of SiC whiskers by pyrolyzing the precursor of oxide and the effects of orienting of whiskaers by doctor-blade method: the strength of the whiskers was kept after sintererd, and furthermore the toughness increased with the change of the bonding force of the whisker matrix interface by coating the surface of whiskers with **Al** {sub 2 } **O** {sub 3} ; high temprature high strenghth composite materials were obtained from compounding whiskers oriented **vertically** against the crack propagation side; additionally, the high temperature creep rupture resistance increased and rupture time was about 9 times rised comparing to that of monolithic. 14 refs., 14 figs., 1 tab.

27/3,AB/20 (Item 4 from file: 103)
DIALOG(R)File 103:Energy SciTec

03314976 AIP-92-010117; EDB-92-088620
Title: Preparation and structural characterization of sputtered CoO, NiO, and Ni sub 0.5 Co sub 0.5 O thin epitaxial films
Author(s): Carey, M.J.; Spada, F.E.; Berkowitz, A.E. (Department of Physics and Center for Magnetic Recording Research 0401, University of California, San Diego, La Jolla, California 92093-0401 (United States)) ; Cao, W.; Thomas, G. (Department of Materials Science and Mineral Engineering, University of California, Berkeley, California 94720 (United States))
Source: Journal of Materials Research (United States) v 6:12. Coden: JMREE ISSN: 0884-2914
Publication Date: Dec 1991
p 2680-2687
Contract Number (DOE): AC03-76SF00098
Language: In English
Abstract: Single phase CoO, NiO, and Ni{sub 0.5}Co{sub 0.5}O epitaxial films have been prepared by reactive sputtering onto {1 angle}0001{r angle} {alpha}--**Al**{sub 2}**O**{sub 3} substrates maintained at 373 K. Epitaxy was confirmed by x-ray diffraction (XRD) and high resolution electron microscopy (HREM) techniques. XRD experiments indicate that these monoxide films are cubic and contain rotation twins with the twin axis parallel to {1 angle}111{r angle}. Lattice parameters for the CoO and NiO films are 0.4254{plus minus}0.0001 nm and 0.4173{plus minus}0.0006 nm, respectively, and agree with published values for the corresponding bulk oxides. The lattice parameter 0.4220{plus minus}0.0001 nm for the Ni{sub 0.5}Co{sub 0.5}O film lies between those of CoO and NiO and suggests that the mixed oxide film is compositionally homogeneous. Cross-sectional HREM images of the Ni{sub 0.5}Co{sub 0.5}O specimen show {Sigma}3(1{bar 1}2) twin boundaries **perpendicular** to the oxide-substrate interface. The twin regions are approximately 30 nm in size and are uniformly distributed throughout the **film**. The epitaxial **orientation** of the monoxide films with respect to the substrate can be summarized by the relationships (111) monoxide //(0001) {alpha}--**Al**{sub 2}**O** {sub 3}, (1{bar 1}0) monoxide //(1{bar 1}00) {alpha}--**Al**{sub 2} **O**{sub 3}, and (11{bar 2}) monoxide //(11{bar 2}0) {alpha}--**Al**{sub 2}**O**{sub 3}.

27/3,AB/21 (Item 5 from file: 103)
DIALOG(R)File 103:Energy SciTec

02971625 NOV-90-042589; INS-90-036651; EDB-91-005250
Title: In-situ growth of superconducting YBa sub 2 Cu sub 3 O sub y films by pulsed laser deposition
Author(s): Boyce, J.B.; Connell, G.A.N.; Fenner, D.B.; Ponce, F.A.; Bridges, F.; Tramontana, J. (Xerox Palo Alto Research Center, CA (USA)); Fork, D.K.; Tahara, S.; Geballe, T.H. (Stanford Univ., CA (USA)); Char, K. (Conductus, Inc., Sunnyvale, CA (US)); Viano, A.M. (Santa Clara Univ., CA (USA)); Laderman, S.S.; Taber, R.C. (Hewlett-Packard Co., Palo Alto, CA (USA))
Title: Processing of films for high T sub c superconducting electronics
Author(s)/Editor(s): Venkatesan, T.
Conference Title: Processing of films for high Tc superconducting electronics
Conference Location: Santa Clara, CA (USA) Conference Date: 10-12 Oct 1989
Publisher: Bellingham, WA (USA) SPIE Society of Photo-Optical Instrumentation Engineers
Publication Date: 1990
p 136-147 (367 p)
Report Number(s): CONF-8910150--
ISBN: 0-8194-0223-0
Language: In English
Abstract: YBa{sub 2}Cu{sub 3}O{sub y} thin films have been deposited in-situ on several substrate materials using pulsed excimer laser deposition. On the substrates, SrTiO{sub 3}, MgO, LaAlO{sub 3}, and yttrium-stabilized zirconia (YSZ), excellent films were obtained. These films had high superconducting transition temperatures (91 K) with narrow transition widths ({approximately}0.5 K), metallic conductivity in the normal state, low room-temperature resistivity ({approximately}250 {mu}{Omega}-cm), high critical currents ({approximately}3 {times} 10A/cm{sup 2} at 4.2 K), c-axis orientation **perpendicular** to the plane of the **film**, and epitaxial **alignment** with the substrate. On the more technologically relevant substrates of **Al**{sub 2}**O**{sub 3} and Si, less optimal results were obtained. The transition temperatures were high (86-88 K) and metallic conductivity was obtained in the normal state. However, the room-temperature and microwave surface resistivities were higher and the critical currents were lower than for the above benchmark substrates. These diminished transport properties correlate with the imperfect alignment and epitaxy of the YBCO and substrate. For **Al**{sub 2}**O**{sub 3} substrates, a narrow substrate-temperature window was found for the best in-situ YBCO films. The poorer transport properties correlate with the lack of registry of the YBCO a-b plane with the **sapphire** r-plane.

27/3,AB/22 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

05965773
E.I. No: EIP01536780880
Title: Ion beam assisted texture evolution during thin film deposition of metal nitrides
Author: Stritzker, B.; Gerlach, J.W.; Six, S.; Rauschenbach, B.
Corporate Source: Institut fur Physik Universitat Augsburg, D-86135 Augsburg, Germany

Conference Title: Ion Beam Synthesis and Processing of Advanced Materials
Conference Location: Boston, MA, United States Conference Date: 20001127-20001129
E.I. Conference No.: 58819
Source: Materials Research Society Symposium - Proceedings v 647 2001. p O9.1.1-O9.1.12
Publication Year: 2001
CODEN: MRSPDH ISSN: 0272-9172
Language: English
Abstract: Ion beam assisted deposition, i.e., the bombardment of thin films with a beam of energetic particles has become a highly developed tool for the preparation of thin films. This technique provides thin films and coatings with modified microstructure and properties. In this paper examples are presented for the modifying of the structure: in-situ modification of texture during ion beam assisted film growth and ion beam enhanced epitaxy. The biaxial alignment of titanium nitride films prepared on Si(111) by nitrogen ion beam assisted deposition at room temperature was studied. The bombardment **perpendicular** to the surface of the substrate causes an left brace 001 right brace alignment of crystallites. A 55 degree ion beam incidence angle produces both a left brace 111 right brace orientation relative to the surface and a left brace 100 right brace orientation relative to the ion beam. This results in a totally fixed orientation of the crystallites. The texture evolution is explained by the existence of open channeling directions. Epitaxial, hexagonal gallium nitride films were grown on c-plane **sapphire** by low-energy nitrogen ion beam assisted deposition (less than approximately equals 25 eV). The ion energy was chosen to be less than the corrected bulk displacement energy to avoid the formation of ion-induced point defects in the bulk. The results show that GaN films with a nearly perfect left brace 0002 right brace texture are formed which have superior crystalline quality than films grown without ion irradiation. The mosaicity and the defect density are reduced. By applying an assisting ion beam during pulsed laser deposition of aluminum nitride on the c-plane of **sapphire**, epitaxial, hexagonal films could be produced. The results prove the beneficial influence of the ion beam on the crystalline quality of the films. An optimum ion energy of 500 eV was found where the medium tilt as well as the medium twist of the crystallites was minimal. 24 Refs.

27/3,AB/23 (Item 2 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

05623777
E.I. No: EIP00085274074
Title: Threading dislocation density reduction in GaN/**sapphire** heterostructures
Author: Kvit, A.; Sharma, A.K.; Narayan, J.
Corporate Source: North Carolina State Univ, Raleigh, NC, USA
Conference Title: The 1999 MRS Fall Meeting - Symposium W 'GaN and Related Alloys'
Conference Location: Boston, MA, USA Conference Date: 19991128-19991203
E.I. Conference No.: 57103
Source: Materials Research Society Symposium - Proceedings v 595 2000. Materials Research Society, Warrendale, PA, USA. p W3.56.1 - W3.56.6
Publication Year: 2000
CODEN: MRSPDH ISSN: 0272-9172
Language: English
Abstract: Large lattice mismatch between GaN and alpha -Al//2O//3 (15%)

leads to the possibility of high threading dislocation densities in the nitride layers grown on **sapphire**. This investigation focused on defect reduction in GaN epitaxial thin layer was investigated as a function of processing variables. The microstructure changes from threading dislocations normal to the basal plane to stacking faults in the basal plane. The plan-view TEM and the corresponding selected-area diffraction patterns show that the film is single crystal and is aligned with a fixed epitaxial orientation to the substrate. The epitaxial relationship was found to be (0001)//G//a//N parallel (0001)//S//a//p and left bracket 01-10 right bracket //G//a//N parallel left bracket minus 12 minus 10 right bracket //S//a//p. This is equivalent to a 30 degree rotation in the basal (0001) plane. The film is found to contain a high density of stacking faults with average spacing 15 nm terminated by partial dislocations. The density of partial dislocations was estimated from plan-view TEM image to be 7 multiplied by 10**9 cm** minus **2. The cross-section image of GaN film shows the density of stacking faults is highest in the vicinity of the interface and decreases markedly near the top of the layer. Inverted domain boundaries, which are almost **perpendicular** to the film surface, are also visible. The concentration of threading dislocation is relatively low (approx. 2 multiplied by 10**8 cm** minus **2), compared to misfit dislocations. The average distance between misfit dislocations was found to be 22 angstrom. Contrast modulations due to the strain near misfit dislocations are seen in high-resolution cross-sectional TEM micrograph of GaN/ alpha -Al//2O//3 interface. This interface is sharp and does not contain any transitional layer. The interfacial region has a high density of Shockley and Frank partial dislocations. Mechanism of accommodation of tensile, sequence and tilt disorder through partial dislocation generation is discussed. In order to achieve low concentration of threading dislocations we need to establish favorable conditions for some stacking disorder in thin layers above the film-substrate interface region. (Author abstract) 9 Refs.

27/3,AB/24 (Item 3 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

04845270
E.I. No: EIP97103863619
Title: Physical properties of Al-doped zinc oxide films prepared by RF magnetron sputtering
Author: Park, Ki Cheol; Ma, Dae Young; Kim, Kun Ho
Corporate Source: Gyeongsang Natl Univ, Chinju, South Korea
Source: Thin Solid Films v 305 n 1-2 Aug 15 1997. p 201-209
Publication Year: 1997
CODEN: THSFAP ISSN: 0040-6090
Language: English
Abstract: Al-doped zinc oxide (AZO) films are prepared by RF magnetron sputtering on glass and Si substrates with specifically designed ZnO targets containing different amounts of Al//2O//3 powder as a doping source. The physical properties of the AZO films are investigated in terms of the preparation conditions, such as Al//2O//3 content in the target, RF power (P//R//F), substrate temperature (T//s) and working pressure (P//w). The crystal structure of the AZO film is hexagonal wurtzite, and all the films show the typical crystallographic orientation, with the c-axis **perpendicular** to the substrate. The growth rate increases with increasing P//R//F, but decreases with increasing T//s and P//w. Films 1500 angstroms thick with the lowest resistivity (rho) of 4.7 multiplied by 10** minus **4 Omega cm and the transmittance over 90% at the visible

region are prepared by using norminal 3 wt.% Al//2O//3 target at T//s equals 150 degree C, P//w equals 2 mTorr and P//R//F equals 150 W. Optical transmittance measurements show that AZO films are degenerate semiconductors with direct bandgap. The optical energy bandgap for undoped ZnO film is approximately 3.3 eV and those for AZO films increase as the carrier concentration (n//e) in the film increases. The blue shift in the AZO films is proportional to one third power of n//e. (Author abstract) 32 Refs.

27/3,AB/25 (Item 4 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

04743882
E.I. No: EIP97073725672
Title: Deposition of BaFe//1//2O//1//9 thin films by a new injection-CVD method
Author: Pignard, S.; Senateur, J.P.; Vincent, H.; Kreisel, J.; Abrutis, A.
Corporate Source: Cent Natl de la Recherche Scientifique, Saint-Martin d'Heres, Fr
Conference Title: Proceedings of the 1996 7th International Conference on Ferrites, ICF
Conference Location: Bordeaux, Fr Conference Date: 19960903-19960906
E.I. Conference No.: 46596
Source: Journal De Physique. IV : JP v 7 n 1 Mar 1997. p 483-484
Publication Year: 1997
CODEN: JPICEI ISSN: 1155-4339
Language: English
Abstract: A new process of injection-MOCVD has been used to synthesize barium hexaferrite thin films on Al//2O//3 (0001) substrates. This new technique uses a liquid source of precursors dissolved in a convenient solvent. X-ray diffraction measurements have been performed to observe thin films lattices with respect to the orientation of the substrate: hexaferrite film epitaxy is observed with c-axis **perpendicular** to the substrate. Magnetic measurements have been performed in the plane and **perpendicular** to the film plane: they confirm the preferential **orientation** of **films**. (Author abstract) 6 Refs.

27/3,AB/26 (Item 5 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

03778270
E.I. No: EIP94011170381
Title: Nonionic surfactants adsorption on silica and **alumina** from water and n-decane
Author: Larin, A.V.; Svitova, T.F.; Frolova, E.A.; Chicherina, N.Yu.
Corporate Source: Inst Fizicheskoj Khimii RAN, Moscow, Russia
Source: Kolloidnyi Zhurnal v 55 n 3 May-Jun 1993. p 109-113
Publication Year: 1993
CODEN: KOZHAG ISSN: 0023-2912
Language: Russian
Abstract: Adsorption of ethoxylated isononylphenols (EO n equals 4; 6 and 10) on silica with different surface areas and activated **alumina** from aqueous solution and n-decane was studied. The equilibrium saturated adsorption values and the minimum areas per surfactant molecule in

saturated layers were determined. It has been established that a surfactant monolayers are formed on the oxides surface within the studied range of surfactant concentrations. In these cases, the orientation of ethoxy changes on the silica surface depends on the surfactant concentration, and varies from horizontal in the range of low surfactant concentrations to **vertical** one at concentrations exceeding 0.1 CMC in aqueous systems. 15 Refs.

27/3,AB/27 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

07902073 Genuine Article#: 221HD Number of References: 11
Title: X-ray diffraction and Rutherford backscattering spectrometry of Ba1NbxTi1-xO3 thin films synthesized by laser ablation (ABSTRACT AVAILABLE)
Author(s): Khan MN (REPRINT) ; Kim HT; Kusawake T; Kudo H; Ohshima K; Uwe H
Corporate Source: ETL,HARD ELECT LAB, UMEZONO 1-1-4/TSUKUBA/IBARAKI 3058568/JAPAN/ (REPRINT); UNIV TSUKUBA,INST APPL PHYS/IBARAKI/OSAKA 305/JAPAN/
Journal: JOURNAL OF APPLIED PHYSICS, 1999, V86, N4 (AUG 15), P2307-2310
ISSN: 0021-8979 Publication date: 19990815
Publisher: AMER INST PHYSICS, CIRCULATION FULFILLMENT DIV, 500 SUNNYSIDE BLVD, WOODBURY, NY 11797-2999
Language: English Document Type: ARTICLE
Abstract: Niobium doped barium titanate Ba1NbxTi1-xO3 thin films have been successfully synthesized by laser ablation on **sapphire** (00(0) over bar 1) and (100) SrTiO3 substrates, for the growth of hexagonal and cubic phases of this system. These films were synthesized with different concentrations of niobium under various conditions. X-ray diffraction measurements showed that the **films** were well **aligned** along the c-axis of the **sapphire** substrate for the hexagonal phase, while **perpendicular** to the SrTiO3 substrate surface for the cubic phase of this system. These films were deposited at substrate temperatures of 700 and 650 degrees C for the hexagonal and cubic phases, respectively, both in oxygen and nitrogen atmospheres. At room temperature these films have a very high resistance and large negative thermopower similar or equal to 300 mV/K. Rutherford backscattering spectrometry (RBS) was performed on very thin films of this system for different concentrations of niobium deposited in the N-2 atmosphere. We have found a deficiency of Ti in these films by RBS analysis, which along with other antisite defects and oxygen deficiency, may be a cause of high resistance and large thermopower in these films. (C) 1999 American Institute of Physics. [S0021-8979(99)07716-6].

27/3,AB/28 (Item 2 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

06819244 Genuine Article#: ZU661 Number of References: 23
Title: Analysis of preferred orientations in PST and PZT thin films on various substrates (ABSTRACT AVAILABLE)
Author(s): Chateigner D (REPRINT) ; Wenk HR; Patel A; Todd M; Barber DJ
Corporate Source: CNRS,CRISTALLOG LAB, BP 166/F-38042 GRENOBLE//FRANCE/ (REPRINT); UNIV CALIF BERKELEY,DEPT GEOL & GEOPHYS/BERKELEY//CA/94720; GEC MARCONI MAT TECHNOL LTD,/CASWELL TOWCESTER NN12

8EQ/NORTHANTS/ENGLAND/; DEF RES AGCY,/MALVERN/WORCS/ENGLAND/; HONG KONG UNIV SCI & TECHNOL,DEPT PHYS/HONG KONG//PEOPLES R CHINA/
Journal: INTEGRATED FERROELECTRICS, 1998, V19, N1-4, P121-140
ISSN: 1058-4587 Publication date: 19980000
Publisher: GORDON BREACH SCI PUBL LTD, C/O STBS LTD, PO BOX 90, READING RG1 8JL, BERKS, ENGLAND
Language: English Document Type: ARTICLE
Abstract: Orientation distributions of Pb(Zr, Ti)O-3 and Pb2ScTaO6 thin films deposited on various substrates and buffer layers are described. All observed textures are basically fibre textures. Only PST films deposited on MgO/(<11(2)over bar 0>)-**Al2O3** show a weak in-plane alignment, with [100] PST **perpendicular** to the film surface. PST films deposited on a Pt/(100)-Si substrate exhibit a strong [111] fibre texture, tilted 5 degrees to the normal. The Pt substrate has also a [111] fibre texture, with orientation densities as high as 60 times the random distribution (m.r.d.). On both substrates, PST films show maxima in the orientation distribution near 35 m.r.d.

PZT films (PZT/Pt/Si-(100) and PZT/Pt/Ti/SiO2/Si-(100)) have a [111] fibre texture. The maximum orientation distribution observed for PZT is 200 m.r.d. A minor [100] fibre component may be present. The Pt textures resemble qualitatively those of PZT, mainly [111]. The addition of a Ti buffer layer on grown SiO2 favors the stabilization of PZT in a tetragonal crystal system, and increases strongly the Pt texture, and to a lesser degree that of PZT.

27/3,AB/29 (Item 3 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

06357462 Genuine Article#: YL899 Number of References: 97
Title: Structure and properties of interface between dissimilar materials (ABSTRACT AVAILABLE)
Author(s): Echigoya J (REPRINT) ; Yamaguchi A.
Corporate Source: IWATE UNIV,FAC ENGN, DEPT MAT SCI & TECHNOL/MORIOKA/IWATE 020/JAPAN/ (REPRINT)
Journal: ISIJ INTERNATIONAL, 1997, V37, N12, P1251-1257
ISSN: 0915-1559 Publication date: 19970000
Publisher: IRON STEEL INST JAPAN KEIDANREN KAIKAN, 9-4 OTEMACHI 1-CHOME CHIYODA-KU, TOKYO 100, JAPAN
Language: English Document Type: REVIEW
Abstract: Recent work has been reviewed concerning the interphase interface between two materials which have different crystal structures and chemical compositions. We focus on the structure, and magnetic and mechanical properties of the interphase interface.

27/3,AB/30 (Item 4 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

06337793 Genuine Article#: YK566 Number of References: 44
Title: Aligned aluminophosphate molecular sieves crystallized on floating anodized **alumina** by hydrothermal microwave heating (ABSTRACT AVAILABLE)
Author(s): Tsai TG; Chao KJ; Guo XJ; Sung SL; Wu CN; Wang YL; Shih HC (REPRINT)
Corporate Source: NATL TSING HUA UNIV,DEPT MAT SCI & ENGN/HSINCHU//TAIWAN/

(REPRINT); NATL TSING HUA UNIV,DEPT MAT SCI & ENGN/HSINCHU//TAIWAN/; NATL TSING HUA UNIV,DEPT CHEM/HSINCHU//TAIWAN/; NATL TAIWAN UNIV,DEPT PHYS/TAIPEI//TAIWAN/; ACAD SINICA,INST ATOM & MOL SCI/TAIPEI//TAIWAN/
Journal: ADVANCED MATERIALS, 1997, V9, N15 (DEC 1), P1154-&
ISSN: 0935-9648 Publication date: 19971201
Publisher: WILEY-V C H VERLAG GMBH, POSTFACH 10 11 61, D-69451 WEINHEIM, GERMANY
Language: English Document Type: ARTICLE
Abstract: Thin **films** of **aligned** zeolite crystals can significantly improve the quality of advanced materials prepared using zeolites as a nanostructured host. A membrane of **vertically** aligned aluminophosphate molecular sieves is prepared on floating anodized **alumina** using microwave heating. The Figure shows the first step in the proposed synthetic scheme-preformed nuclei penetrate the cylindrical nanochannels of the **alumina** substrate.

27/3,AB/31 (Item 5 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05991403 Genuine Article#: XM733 Number of References: 15
Title: Preparation of piezoelectric-coefficient modulated multilayer film ZnO/**Al2O3** and its ultrahigh frequency resonance (ABSTRACT AVAILABLE)
Author(s): Hu WS (REPRINT) ; Liu ZG; Wu RX; Chen YF; Ji W; Yu T; Feng D
Corporate Source: NANJING UNIV,NATL LAB SOLID STATE MICROSTRUCT/NANJING 210093//PEOPLES R CHINA/ (REPRINT); NANJING UNIV,DEPT ELECT SCI & ENGN/NANJING 210093//PEOPLES R CHINA/
Journal: APPLIED PHYSICS LETTERS, 1997, V71, N4 (JUL 28), P548-550
ISSN: 0003-6951 Publication date: 19970728
Publisher: AMER INST PHYSICS, CIRCULATION FULFILLMENT DIV, 500 SUNNYSIDE BLVD, WOODBURY, NY 11797-2999
Language: English Document Type: ARTICLE
Abstract: Multilayer films composed of piezoelectrically active ZnO and inactive **Al2O3** layers were prepared on silicon by a pulsed laser deposition technique. The ZnO layers were completely (001) textured to generate a single piezoelectric coefficient d(33) **perpendicular** to the substrate surface and the **Al2O3** layers were amorphous at 375 degrees C. The interfacial sharpness and the **film orientation** were analyzed by low and high angle x-ray diffraction theta-2 theta scanning. High frequency resonance of 10.6 GHz was measured and higher values up to 100 GHz are expected in the multilayer films with periods 320 nm or smaller. (C) 1997 American Institute of Physics.

27/3,AB/32 (Item 6 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05989932 Genuine Article#: BJ22G Number of References: 16
Title: Growth of oriented zeolite crystal membranes (ABSTRACT AVAILABLE)
Author(s): Cheng MJ (REPRINT) ; Lin LW; Yang WS; Yang YS; Xu YD; Li XS
Corporate Source: CHINESE ACAD SCI,DALIAN INST CHEM PHYS, STATE KEY LAB CATALYSIS/DALIAN 116023//PEOPLES R CHINA/ (REPRINT)
, 1997, V105, A-C, P2233-2240
Publication date: 19970000
Publisher: ELSEVIER SCIENCE PUBL B V, SARA BURGERHARTSTRAAT 25, PO BOX 211,

1000 AE AMSTERDAM, NETHERLANDSSTUDIES IN SURFACE SCIENCE AND CATALYSIS
Series: STUDIES IN SURFACE SCIENCE AND CATALYSIS
Language: English Document Type: ARTICLE
Abstract: Silicalite-1 crystals were grown with **vertical** orientation on porous **alumina** supports and with lateral orientation on dense flat glass slabs. The crystallization of the oriented silicalite-1 crystals on porous **alumina** supports were investigated, and it was found that the growth mechanism lies in both nucleation and crystal growth of crystallization. A model of pentasil **layer** structures preferred **orientation** was proposed for the explanation of crystals on glass slabs.

27/3,AB/33 (Item 7 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05793994 Genuine Article#: WX942 Number of References: 25
Title: Atomic structure of epitaxial Nb-**Al2O3** interfaces .2. Misfit dislocations (ABSTRACT AVAILABLE)
Author(s): Gutekunst G (REPRINT) ; Mayer J; Vitek V; Ruhle M
Corporate Source: MAX PLANCK INST MET RES,INST WERKSTOFFWISSENSCH, SESSTR 92/D-70174 STUTTGART//GERMANY/ (REPRINT); UNIV PENN,DEPT MAT SCI & ENGN/PHILADELPHIA//PA/19104
Journal: PHILOSOPHICAL MAGAZINE A-PHYSICS OF CONDENSED MATTER STRUCTURE DEFECTS AND MECHANICAL PROPERTIES, 1997, V75, N5 (MAY), P1357-1382
ISSN: 0141-8610 Publication date: 19970500
Publisher: TAYLOR & FRANCIS LTD, ONE GUNDPOWDER SQUARE, LONDON, ENGLAND EC4A 3DE
Language: English Document Type: ARTICLE
Abstract: Four Nb-**Al2O3** interfaces were generated by depositing Nb on (0001)(S), (<01(1)over bar 0>)(S), (<2(1)over bar><(1)over bar 0>)(S) and (<01(1)over bar 2>)(S) alpha-**Al2O3** (**sapphire**) surfaces by molecular-beam epitaxy. High-resolution transmission electron microscopy (HRTEM) studies showed that the interfaces are semicoherent for the film thicknesses investigated, that is coherent regions alternate with misfit dislocations at the interfaces. The visible displacement field around the core of the dislocations is restricted to the Nb lattice. The Burgers vector of the misfit dislocations is therefore assigned to the lattice of the Nb. The Burgers vector is determined by HRTEM using the concept of a Burgers circuit around the core of the misfit dislocations. Since this core is in general at the interface, the Burgers circuit has to cross the interface.

The dislocation networks, which accommodate the mismatch between the lattice of the Nb and the **sapphire**, are built up by misfit dislocations with a Burgers vector of 1/2 (111). This Burgers vector corresponds to the Burgers vector of bulk dislocations in Nb. The Burgers vector of the misfit dislocations is not always parallel to the interface nor are all misfit dislocations pure edge dislocations. Only the edge component b(MD) of the Burgers vector, which is parallel to the interface, accommodates the lattice mismatch at these interfaces. Screw components b(screw) and/or edge components b(**perpendicular** to), which are **perpendicular** to the interface, are in general compensated in the networks. Only in the system where the interface is parallel to (<01(1)over bar 2>)(S) does an array of misfit dislocations with an uncompensated Burgers vector compoennt b(**perpendicular** to) lead to a tilt of the Nb lattice with respect to the **sapphire** lattice.

27/3,AB/34 (Item 8 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

05332942 Genuine Article#: VM089 Number of References: 18
Title: HETEROEPITAXIAL GROWTH OF TIO2 FILMS BY ION-BEAM SPUTTER-DEPOSITION (Abstract Available)
Author(s): HOTSENPILLER PAM; WILSON GA; ROSHKO A; ROTHMAN JB; ROHRER GS
Corporate Source: DUPONT CO INC,EXPT STN/WILMINGTON//DE/19880; NATL INST STAND & TECHNOL/BOULDER//CO/80303; UNIV PENN,RES STRUCT MATTER LAB/PHILADELPHIA//PA/19104; CARNEGIE MELLON UNIV,DEPT MAT SCI & ENGN/PITTSBURGH//PA/15213
Journal: JOURNAL OF CRYSTAL GROWTH, 1996, V166, N1-4 (SEP), P779-785
ISSN: 0022-0248
Language: ENGLISH Document Type: ARTICLE
Abstract: Heteroepitaxial TiO2 films of the rutile and anatase phases have been grown using the ion-beam sputter deposition technique. The orientations of the highest-quality rutile films grown and their corresponding substrates are (100)/(0001)**Al2O3**, (101)/(<11(2)over bar 0>)**Al2O3**, (001)/(<10(1)over bar 0>)**Al2O3**, and (110)/(110)MgO. This is the first report of the heteroepitaxial growth of (001)/(<10(1)over bar 0>)**Al2O3** and (110)/(110)MgO rutile films. Results indicate that the **films** are **aligned** both **perpendicular** and parallel to the plane of the film. Distinct surface morphologies are observed for each orientation. The (100) and (101) rutile orientations were also grown on (111)MgO and (<1(1)over bar 02>)**Al2O3**, respectively. The (100) anatase grew on both (100)MgO and MgAl2O4. The growth mechanisms of several rutile films on **Al2O3** substrates were investigated, and the data suggest island or Volmer-Weber type growth.

27/3,AB/35 (Item 9 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

04765721 Genuine Article#: UF782 Number of References: 20
Title: SHIELDING DUE TO ALIGNED MICROCRACKS IN ANISOTROPIC MEDIA (Abstract Available)
Author(s): MUJU S; ANDERSON PM; MENDELSOHN DA
Corporate Source: OHIO STATE UNIV,DEPT APPL MECH/COLUMBUS//OH/43210; OHIO STATE UNIV,DEPT MAT SCI & ENGN/COLUMBUS//OH/43210
Journal: MECHANICS OF MATERIALS, 1996, V22, N3 (MAR), P203-217
ISSN: 0167-6636
Language: ENGLISH Document Type: ARTICLE
Abstract: This work presents a continuum damage analysis of the effect of aligned microcracks on a dominant crack in an otherwise anisotropic medium. This geometry is particularly relevant for composite media with an aligned reinforcement phase, where aligned cracking can change the magnitude and principal axes of anisotropy. Provided that the density of aligned microcracks reaches a stable saturation value near the crack tip, the near-tip stress intensity factor, K-I(s), may be related to the remote value, K-I(o) in terms of the anisotropic properties of the undamaged and saturated media.

Results show that of all types of damage, that which increases compliance in a direction normal to the crack plane typically reduces

K-I(s)/K-I(o) near the crack tip most significantly, while comparable increases in compliance parallel to the crack growth direction produce a relatively small change. Reduction in K-I(s)/K-I(o) due to increased shear compliance may be 80% of that due to increased compliance normal to the crack plane.

For damage consisting of aligned microcracks, the most effective reduction in K-I(s)/K-I(o) occurs when the microcracks are oriented parallel, rather than **perpendicular** to the main crack. This conclusion holds even for **alumina**/aluminum and graphite/epoxy systems that display large anisotropy. Tn those cases, optimal reduction in K-I(s)/K-I(o) occurs when in addition to parallel macro and microcracks, the stiffer direction is **perpendicular** to the crack surfaces. This case corresponds, for example, to macrocrack extension **perpendicular** to **aligned** fibers or **layers** in composite materials, with pinned microcracking through fiber or layer cross sections.

27/3,AB/36 (Item 10 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

02321297 Genuine Article#: KT869 Number of References: 30
Title: RAMAN-SCATTERING AND X-RAY-DIFFRACTOMETRY STUDIES OF EPITAXIAL TIO2 AND VO2 THIN-FILMS AND MULTILAYERS ON ALPHA-**AL2O3** (11(2)OVER-BAR-0) (Abstract Available)
Author(s): FOSTER CM; CHIARELLO RP; CHANG HLM; YOU H; ZHANG TJ; FRASE H; PARKER JC; LAM DJ
Corporate Source: ARGONNE NATL LAB,DIV MAT SCI,9700 S CASS AVE/ARGONNE//IL/60439; NANOPHASE TECHNOL CORP/DARIEN//IL/60559
Journal: JOURNAL OF APPLIED PHYSICS, 1993, V73, N6 (MAR 15), P2841-2847
ISSN: 0021-8979
Language: ENGLISH Document Type: ARTICLE
Abstract: Epitaxial thin films of TiO2 and VO2 single layers and TiO2/VO2 multilayers were grown on (1120BAR) **sapphire** (alpha-**Al2O3**) substrates using the metalorganic chemical vapor deposition technique and were characterized using Raman scattering and four-circle x-ray diffractometry. X-ray diffraction results indicate that the films are high quality single crystal material with well defined growth plane and small in-plane and out-of-plane mosaic. Single-layer films are shown to obey the Raman selection rules of TiO2 and VO2 single crystals. The close adherence to the Raman selection rules indicates the high degree of **orientation** of the **films**, both parallel and **perpendicular** to the growth plane. Selection rule spectra of two and three layer TiO2/VO2 multilayers are dominated by the VO2 layers with only minimal signature of the TiO2 layers. Due to the low band gap of semiconducting vanadium dioxide, we attribute the strong signature of the VO2 layers to resonant enhancement of the VO2 Raman component accompanied with absorption of the both the incident and scattered laser light from the TiO2 layers.

27/3,AB/37 (Item 11 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

02094237 Genuine Article#: KA634 Number of References: 8
Title: LATERAL ORIENTATION RELATIONSHIP BETWEEN YBA2CU3O7-X THIN-FILMS AND

MGO(100) AND LAALO3(102) SUBSTRATES (Abstract Available)
Author(s): WANG JY; WANG LG; YOUNG CC; HSU SE
Corporate Source: CHUNG SHAN INST SCI & TECHNOL,CTR MAT RES & DEV,POB 90008-8 LUNGTAN/TAOYUAN//TAIWAN/
Journal: MATERIALS CHEMISTRY AND PHYSICS, 1992, V32, N3 (OCT), P295-299
ISSN: 0254-0584
Language: ENGLISH Document Type: ARTICLE
Abstract: Thin films YBa2Cu3O7-x (YBCO) were grown epitaxially on MgO(100) and LaAlO3(102), respectively, by pulsed KrF excimer laser ablation. The c-axis of YBCO films was found to be perfectly **perpendicular** to the plane of substrates used. Combined measurements of X-ray pole-figures and Laue diffraction patterns show that two sets of orientation relationships exist between the a-b plane of YBCO films and both substrates. For the MgO(100) substrate, the a-axis of YBCO films is parallel to either the [001] or [011] directions of the substrate. The latter is more preferential, possibly due to less mismatch between YBCO(300) and MgO(220). In the case of the LaAlO3(102) substrate, the a-axis of the YBCO **films** is **aligned** either in the [010] or in the [221BAR] direction of the substrate. A small lattice mismatch of 0.3% favors the latter case.

27/3,AB/38 (Item 12 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

01378871 Genuine Article#: GU339 Number of References: 15
Title: PREPARATION AND STRUCTURAL CHARACTERIZATION OF SPUTTERED COO, NIO, AND NI0.5CO0.5O THIN EPITAXIAL-FILMS (Abstract Available)
Author(s): CAREY MJ; SPADA FE; BERKOWITZ AE; CAO W; THOMAS G
Corporate Source: UNIV CALIF SAN DIEGO,DEPT PHYS/LA JOLLA//CA/92093; UNIV CALIF SAN DIEGO,CTR MAGNET RECORDING RES 0401/LA JOLLA//CA/92093; UNIV CALIF BERKELEY,DEPT MAT SCI & MINERAL ENGN/BERKELEY//CA/94720
Journal: JOURNAL OF MATERIALS RESEARCH, 1991, V6, N12, P2680-2687
Language: ENGLISH Document Type: ARTICLE
Abstract: Single phase CoO, NiO, and Ni0.5Co0.5O epitaxial films have been prepared by reactive sputtering onto <0001> alpha-**Al2O3** substrates maintained at 373 K. Epitaxy was confirmed by x-ray diffraction (XRD) and high resolution electron microscopy (HREM) techniques. XRD experiments indicate that these monoxide films are cubic and contain rotation twins with the twin axis parallel to <111>. Lattice parameters for the CoO and NiO films are 0.4254 +/- 0.0001 nm and 0.4173 +/- 0.0006 nm, respectively, and agree with published values for the corresponding bulk oxides. The lattice parameter 0.4220 +/- 0.0001 nm for the Ni0.5Co0.5O film lies between those of CoO and NiO and suggests that the mixed oxide film is compositionally homogeneous. Cross-sectional HREM images of the Ni0.5Co0.5O specimen show SIGMA-3(112BAR) twin boundaries **perpendicular** to the oxide-substrate interface. The twin regions are approximately 30 nm in size and are uniformly distributed throughout the **film**. The epitaxial **orientation** of the monoxide films with respect to the substrate can be summarized by the relationships [111] monoxide // [0001] alpha-**Al2O3**, [110BAR] monoxide // [1100BAR] alpha-**Al2O3**, and [112BAR] monoxide // [1120BAR] alpha-**Al2O3**.

27/3,AB/39 (Item 1 from file: 35)
DIALOG(R)File 35:Dissertation Abs Online

01811343 AADAAI3000580
Growth and characterization of epitaxial films and magnetic multilayers grown by DC sputtering
Author: Loloee, Reza
Degree: Ph.D.
Year: 2000
Corporate Source/Institution: Michigan State University (0128)
Source: VOLUME 62/01-B OF DISSERTATION ABSTRACTS INTERNATIONAL.
PAGE 476. 219 PAGES
ISBN: 0-493-09308-7

Epitaxial Nb-Cu-Co and Nb-Cu-Permalloy™ (‘Py’) multilayers have been grown on (1 1 2¯ 0) **sapphire** substrates by sputter deposition. Electron backscatter diffraction patterns (EBSPs) have been used to characterize individual layers, while atomic force microscopy (AFM) was used for studying surface topography. EBSP is a valuable technique for characterization of these thin sputtered films and shows that the Nb films grow as high-quality epitaxial single crystals with (110)_{bcc} **orientations**. Cu **films** grown on the epitaxial Nb display two in-plane epitaxial variants corresponding to two stacking sequences of {111}_{fcc} planes. These Cu variants take up the Nishiyama-Wasserman orientation relationship with the underlying Nb. Subsequent sputtering of Co or Py on the epitaxial Cu films results in growth of two variants of {111}_{fcc} **layers**. **Orientation** maps of the epitaxial Cu, Co, and Py films grown at elevated temperatures, which illustrate the size and distribution of the growth variants, are presented. The EBSP analysis of the epitaxial Cu, Co, and Py samples grown at 90°C or room temperature revealed that two different orientation variants are present. However, due to degradation of the associated EBSP patterns, mapping of the orientation distributions was not possible.

In this dissertation, the effects of epitaxial growth of sputter-deposited multilayers and spin-valves in a chosen orientation on the magneto-transport properties of these systems are discussed. In particular, sputter-deposited (Py-Cu-Py-FeMn) exchange-biased spin-valves (EBSV) structures were chosen for epitaxial (111)-orientated giant magnetoresistance (GMR) measurements. Optical lithography was used to prepare samples allowing current flow **perpendicular** to the layer plane (CPP), which provides the best access to the fundamental GMR parameters. The results obtained from magneto-transport measurements revealed that the deposition rate affects the exchange anisotropy between ferromagnetic and antiferromagnetic layers, the CPP-magnetoresistance, and the coercive field of the epitaxial EBSV. Studies of pinning the ferromagnetic layer to the adjacent antiferromagnetic layer along different in-plane axes provided information about the magnetocrystalline and shape anisotropy of both pinned and free ferromagnetic layers. Results have been compared to those for polycrystalline samples.

27/3,AB/40 (Item 2 from file: 35)
DIALOG(R)File 35:Dissertation Abs Online

01252255 AAD9233214
HETEROEPITAXIAL GROWTH OF GALLIUM NITRIDE AND NATIVE DEFECT FORMATION IN III-V NITRIDES
Author: LEI, TING
Degree: PH.D.

Year: 1993
Corporate Source/Institution: BOSTON UNIVERSITY (0017)
Source: VOLUME 53/07-B OF DISSERTATION ABSTRACTS INTERNATIONAL.
PAGE 3568. 149 PAGES

ECR-MBE was developed as a new method for the growth of GaN films. In this method, the film growth proceeds by the reaction of Ga vapor with ECR-activated molecular nitrogen at relatively low temperatures, which allow the growth of stoichiometric GaN films. In addition, the ultrahigh vacuum environment reduces the incorporation of unwanted impurities. To control nucleation and initial growth, a new growth process has been developed, in which a GaN buffer layer is grown first at relatively low temperatures, where the growth is dominated by kinetics. The growth of the rest of the film proceeds at elevated temperatures, where the growth is dominated by thermodynamics. This deposition method was found to lead to a quasi-layer-by-layer growth with a lateral growth rate 100 times faster than the **vertical** one. The surface roughness of the film was found to be less than 100A.

Epitaxial single crystalline GaN films were grown for the first time in Si(001) and (111) substrates, using this two-step process. The GaN films on Si(001) are single crystalline, and epitaxially stabilized in the metastable zincblende structure. The GaN films on Si(111) were grown in the wurtzite structure, and were found to have a considerable number of stacking faults along the (0002) direction, which gives rise to a significant zincblende component with (111) **orientation**. Heteroepitaxial GaN **films** were also grown on more widely used a-plane and r-plane **sapphire** substrates using this two-step growth process.

The structure, microstructure and epitaxial relationship to the substrate of GaN films were investigated by RHEED, X-ray diffraction and electron microscopy. Stacking faults have been identified for the first time as one of the dominant structural faults in GaN films with (0002) orientation.

Electrical properties of GaN films were investigated and a new transport mechanism involving two conduction paths was proposed. Optical properties were studied by absorption measurement and cathodoluminescence.

Ab-initio quantum total energy calculations were performed to study the formation of the native defects in GaN and BN. Preliminary results on the wurtzite GaN confirm that nitrogen vacancies are the dominant native point defects giving rise to n-type conductivity. Additionally, these calculations also predict defect induced stabilization of cubic BN over graphitic BN.

27/3,AB/41 (Item 3 from file: 35)
DIALOG(R)File 35:Dissertation Abs Online

01170411 AAD9123290
DEPOSITION OF YTTRIUM BARIUM COPPER OXIDE SUPERCONDUCTING THIN FILMS BY RF MAGNETRON SPUTTERING (BARIUM, COPPER OXIDE)
Author: PARKHE, VIJAY DATTATRAYA
Degree: PH.D.
Year: 1990
Corporate Source/Institution: RUTGERS UNIVERSITY THE STATE U. OF NEW JERSEY (NEW BRUNSWICK) (0190)
Source: VOLUME 52/03-B OF DISSERTATION ABSTRACTS INTERNATIONAL.
PAGE 1666. 145 PAGES

The deposition of Y-Ba-Cu-O (123) high temperature superconducting

thin films using RF magnetron sputtering was investigated. The effects of sputtering conditions and the post deposition heat-treatment on the structure and superconducting properties of the films were studied. The films were grown on single crystals of (100) SrTiO$\sb3$, (100) MgO and (012) **sapphire** substrates. In case of **sapphire** a reactively sputtered zirconia barrier layer was beneficial in reducing the interaction of the film and the substrate.

The films grown without substrate heating were amorphous after deposition while the films made at high temperature ($\sim$700$\sp\circ$C) in oxygen ambient were crystalline and superconducting after the deposition. These latter films were oriented with the c axis **perpendicular** to the plane of the substrate. The films deposited without the substrate heating produced random **orientation** in the **film** after high temperature annealing ($\sim$900$\sp\circ$C) in oxygen atmosphere.

The composition of the film was dependent on composition of the target and the position of the substrate during deposition. The films directly above the oxide target suffered from negative ion and focussed secondary electron bombardment resulting in barium and copper deficient compositions compared to that of the target. The film compositions were determined using Rutherford backscattering spectroscopy (RBS). Using off stoichiometric target compositions and by positioning the substrate away from the target gave the 123 composition.

The effect of a secondary magnetic field during sputtering on the structure and the superconducting properties of the film were studied using a ring magnet on the back of the substrate. The application of this field improved the degree of orientation and the superconducting properties of the film. The films deposited on (100) SrTiO$\sb3$ had T$\sb{\rm on}$ around 91 K and T$\sb{\rm o}$ around 86 K. On the other hand in the absence of the secondary magnetic field the films on (100) SrTiO$\sb3$ T$\sb{\rm on}$ around 90 K and T$\sb{\rm o}$ around 81 K were obtained.

Epitaxial films of 123 were grown on (100) MgO substrates with 700$\sp\circ$C substrate temperature. The ω rocking curves on (005) gave FWHM of 0.4$\sp\circ$. When films were annealed at high temperature among the substrates used MgO showed the least interaction (followed by SrTiO$\sb3$ and **sapphire**) with the film.

RF magnetron sputtering with some modifications in the deposition conditions was found to be a reproducible technique to deposit superconducting 123 films from a single oxide target.

27/3,AB/42 (Item 1 from file: 94)
DIALOG(R)File 94:JICST-EPlus

00920536 JICST ACCESSION NUMBER: 89A0361102 FILE SEGMENT: JICST-E
Properties of aluminum-doped ZnO thin films grown by electron beam evaporation.
KUROYANAGI A (1)
(1) Inst. Vocational and Technical Education, Sagamihara, JPN
Jpn J Appl Phys Part 1, 1989, VOL.28,NO.2, PAGE.219-222, FIG.7, REF.9
JOURNAL NUMBER: G0520BAE ISSN NO: 0021-4922
UNIVERSAL DECIMAL CLASSIFICATION: 539.23:54-31
LANGUAGE: English COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Original paper
MEDIA TYPE: Printed Publication
ABSTRACT: Highly conductive thin films of ZnO have been prepared by conventional electron beam evaporation on glass substrates. The

Al2O3 content of 0-5wt% was added as dopant into ZnO to decrease resistivity of ZnO films. An Al-doped ZnO film with a resistivity of 1.0*10-3.OMEGA.cm is obtained at a substrate temperature of 300.DEG.C with 1.0wt% **Al2O3** content; transmittance of this film is above 90% in the visible range with 100nm thickness. The ZnO source material doped with **Al2O3** is evaporated efficiently by a lower electron beam power compared to the case of nondoped ZnO. The c-axis **orientation** of ZnO **films** is facilitated by the addition of **Al2O3** and the c-axis of Al-doped ZnO films is oriented **perpendicular** to glass substrates in the substrate temperature range of 60.DEG.C-350.DEG.C.(author abst.)

27/3,AB/43 (Item 1 from file: 144)
DIALOG(R)File 144:Pascal
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14460558 PASCAL No.: 00-0120241
Multifunctional Si SUB 3 N SUB 4 /(beta -SiAlON + TiN) layered composites
LENCES Z; SAJGALIK P; TORIYAMA M; BRITO M E; KANZAKI S
Synergy Ceramics Laboratory, Fine Ceramics Research Association, Nagoya 462-8510, Japan; Institute of Inorganic Chemistry, Slovak Academy of Sciences, 842 36 Bratislava, Slovakia; National Industrial Research Institute of Nagoya, Nagoya 462-8510, Japan
Journal: Journal of the European Ceramic Society, 2000, 20 (3) 347-355
Language: English
Layered multifunctional ceramic composites on the base of Si SUB 3 N SUB 4 and TiN have been prepared by tape casting. The reaction conditions for in situ preparation of beta -SiAlON + TiN composite were optimised and dense Si SUB 3 N SUB 4 /(beta -SiAlON + TiN) layered materials were prepared by hot pressing. The bending strength and fracture toughness of layered materials measured in the direction **perpendicular** to the **layer alignment** were remarkably higher (1184 MPa and 9.75 MPa m SUP 1 SUP / SUP 2) in comparison to the "monolithic" beta -SiAlON + TiN composite (647 MPa and 4.71 MPa m SUP 1 SUP / SUP 2). High anisotropy was achieved for the electrical resistance of the layered materials in parallel (6.10 SUP - SUP 2 OMEGA cm) and **perpendicular** (5 x 10 SUP 1 SUP 1 omega cm) direction to the **layer alignment**.

27/3,AB/44 (Item 2 from file: 144)
DIALOG(R)File 144:Pascal
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14182833 PASCAL No.: 99-0381565
X-ray diffraction and Rutherford backscattering spectrometry of Ba SUB 1 Nb SUB x Ti SUB 1 SUB - SUB x O SUB 3 thin films synthesized by laser ablation
NASIR KHAN M; KIM Hyun-Tak; KUSAWAKE T; KUDO H; OHSHIMA K; UWE H
Institute of Applied Physics, University of Tsukuba, Tsukuba, Ibaraki 305, Japan
Journal: Journal of applied physics, 1999-08-15, 86 (4) 2307-2310
Language: English
Niobium doped barium titanate Ba SUB 1 Nb SUB x Ti SUB 1 SUB - SUB x O SUB 3 thin films have been successfully synthesized by laser ablation on **sapphire** (0001) and (100) SrTiO SUB 3 substrates, for the growth of

hexagonal and cubic phases of this system. These films were synthesized with different concentrations of niobium under various conditions. X-ray diffraction measurements showed that the **films** were well **aligned** along the c-axis of the **sapphire** substrate for the hexagonal phase, while **perpendicular** to the SrTiO SUB 3 substrate surface for the cubic phase of this system. These films were deposited at substrate temperatures of 700 and 650<hair thin space> Degree C for the hexagonal and cubic phases, respectively, both in oxygen and nitrogen atmospheres. At room temperature these films have a very high resistance and large negative thermopower similar = 300 mV/K. Rutherford backscattering spectrometry (RBS) was performed on very thin films of this system for different concentrations of niobium deposited in the N SUB 2 atmosphere. We have found a deficiency of Ti in these films by RBS analysis, which along with other antisite defects and oxygen deficiency, may be a cause of high resistance and large thermopower in these films. (c) 1999 American Institute of Physics.

27/3,AB/45 (Item 3 from file: 144)
DIALOG(R)File 144:Pascal

13369558 PASCAL No.: 97-0554952
Epitaxial relationships between GaN and **Al** SUB 2 **O** SUB 3 (0001) substrates
GRANDJEAN N; MASSIES J; VENNEGUES P; LAUGT M; LEROUX M
Centre de Recherche sur lHetero-Epitaxie et ses Applications, Centre National de la Recherche Scientifique, 06560 Valbonne, France
Journal: Applied physics letters, 1997-02-03, 70 (5) 643-645
Language: English
GaN thin layers (200 A) were grown by gas-source molecular beam epitaxy on c-plane **Al** SUB 2 **O** SUB 3 substrates. Transmission electron microscopy reveals that two different epitaxial relationships may occur. The well-known GaN orientation with the c axis **perpendicular** to the **Al** SUB 2 **O** SUB 3 surface and (1100) SUB G SUB a SUB N parallel (1120) SUB A SUB l SUB 2 SUB O SUB 3 is observed when the substrate is nitridated prior to the growth. On the other hand, GaN layers deposited on bare **Al** SUB 2 **O** SUB 3 surfaces exhibit a different crystallographic orientation: (1120) SUB G SUB a SUB N parallel (1100) SUB A SUB l SUB 2 SUB O SUB 3 and (1103) SUB G SUB a SUB N parallel (1120) SUB A SUB l SUB 2 SUB O SUB 3 . This corresponds to a tilt of about 19 Degree of the c axis with respect to the substrate surface. (c) 1997 American Institute of Physics.

27/3,AB/46 (Item 4 from file: 144)
DIALOG(R)File 144:Pascal

13080496 PASCAL No.: 97-0375211
Deposition of BaFe SUB 1 SUB 2 O SUB 1 SUB 9 thin films by a new injection-CVD method
PIGNARD S; SENATEUR J P; VINCENT H; KREISEL J; ABRUTIS A
CAGAN Vladimir, ed; GUYOT Marcel, ed
L.M.G.P., UMR 5628 du CNRS, E.N.S. de Physique de Grenoble, 38402 Saint-Martin d'Heres, France; Department of General and Inorganic

Chemistry, Faculty of Chemistry, Vilnius University, 2734 Vilnius, Lithuania
CNRS/UVSQ, Versailles, France
Centre national de la recherche scientifique, Paris, France.; Japan Society of Powder and Powder Metallurgy, Japan.; Societe francaise de physique, Paris, France.; International Union of Pure and Applied Physics, Goeteborg, Sweden.; IEEE Magnetic Society of Japan, Japan.; European Physical Society, Petit-Lancy, Switzerland.; Societe des electriciens et electroniciens, Paris, France.
ICF7: International Conference on Ferrites, 7 (Bordeaux FRA) 1996-09-03
Journal: Journal de physique. IV, 1997, 7 (1) C1.483-C1.484
Language: English
A new process of injection-MOCVD has been used to synthesize barium hexaferrite thin films on **Al** SUB 2 **O** SUB 3 (0001) substrates. This new technique uses a liquid source of precursors dissolved in a convenient solvent. X-ray diffraction measurements have been performed to observe thin films lattices with respect to the orientation of the substrate: hexaferrite film epitaxy is observed with c-axis **perpendicular** to the substrate. Magnetic measurements have been performed in the plane and **perpendicular** to the film plane: they confirm the preferential **orientation** of **films**.

27/3,AB/47 (Item 5 from file: 144)
DIALOG(R)File 144:Pascal

12769178 PASCAL No.: 96-0484236
Heteroepitaxial growth of TiO SUB 2 films by ion-beam sputter deposition
Crystal growth 1995
HOTSENPILLER P A M; WILSON G A; ROSHKO A; ROTHMAN J B; ROHRER G S
BOATNER L A, ed; DRYBURGH P M, ed
DuPont Company, Experimental Station, Wilmington, Delaware 19880-0356, United States; National Institute of Standards and Technology, Boulder, Colorado 80303-3328, United States; Laboratory for Research on the Structure of Matter, University of Pennsylvania, Philadelphia, Pennsylvania 19104, United States; Department of Materials Science and Engineering, Carnegie Mellon University, Pittsburg, Pennsylvania 15213, United States
Oak Ridge National Laboratory, Oak Ridge, TN, United States; University of Edinburgh, Scotland, United Kingdom
International Conference on Crystal Growth, 11 (The Hague NLD) 1995-06-18
Journal: Journal of crystal growth, 1996, 166 (1-4) 779-785
Language: English
Heteroepitaxial TiO SUB 2 films of the rutile and anatase phases have been grown using the ion-beam sputter deposition technique. The orientations of the highest-quality rutile films grown and their corresponding substrates are (100)/(0001)**Al** SUB 2 **O** SUB 3 , (101)/(1120)**Al** SUB 2 **O** SUB 3 , (001)/(1010)**Al** SUB 2 **O** SUB 3 , and (110)/(110)MgO. This is the first report of the heteroepitaxial growth of (001)/(1010)**Al** SUB 2 **O** SUB 3 and (110)/(110)MgO rutile films. Results indicate that the **films** are **aligned** both **perpendicular** and parallel to the plane of the film. Distinct surface morphologies are observed for each orientation. The (100) and (101) rutile orientations were also grown on (111)MgO and (1102) **Al** SUB 2 **O** SUB 3 , respectively. The (100) anatase grew on both (100)MgO and MgAl SUB 2 O SUB 4 . The growth mechanisms of several rutile

films on **Al** SUB 2 **O** SUB 3 substrates were investigated, and the data suggest island or Volmer-Weber type growth.

27/3,AB/48 (Item 6 from file: 144)
DIALOG(R)File 144:Pascal

11526149 PASCAL No.: 94-0368939
Elaboration et caracterisation de couches minces de YBa SUB 2 Cu SUB 3 O SUB 7 SUB - SUB delta . Mecanismes de croissance de films orientes avec l'axe a perpendicaulaire au plan du substrat
(Elaboration and characterisation of YBA SUB 2 Cu SUB 3 O SUB 7 SUB - SUB delta thin films. Growth mechanisms of films with a-axis **perpendicular** to the substrate)
GUILHON BLANC Beatrice; MURRAY Hugues, dir
Universite de Caen, Francee
Univ.: Universite de Caen. FRA Degree: Th. doct.
1993-11; 1993 93 p.
Language: French Summary Language: French; English
Des couches minces supraconductrices de YBa SUB 2 Cu SUB 3 O SUB 7 ont ete realisees par ablation laser. Les depots de films s'effectuent entierement in-situ. Dans un premier temps, des couches ayant l'axe c perpendiculaire au plan du substrat ont ete deposees sur MgO(100), LaAlO SUB 3 (100), Si(100) et **Al** SUB 2 **O** SUB 3 polycristallin. Pour ces deux derniers substrats, l'etude du depot d'une couche de ZrO SUB 2 a ete necessaire. Les films ont ete caracterises electriquement et morphologiquement. Le coefficient d'absorption de YBa SUB 2 Cu SUB 3 O SUB 7 a ete mesure a partir de couches realisees sur MgO. Sur MgO(100) et LaAlO SUB 3 (100), il a ete possible d'obtenir des **films** ayant une **orientation** a perpendiculaire au plan du substrat en modifiant les conditions de depot. Ces films ont des temperatures de 89 K sur MgO et 83 K sur LaAlO SUB 3 . Les mecanismes de croissance ont ete etudies et il a ete mis un changement d'orientation a en c. Ce mecanisme de transformation a ete etudie sur LaAlO SUB 3 et a permis de proposer un modele expliquant le blocage de cette transformation par le depot prealable d'une couche de PrBa SUB 2 Cu SUB 3 O SUB 7

27/3,AB/49 (Item 7 from file: 144)
DIALOG(R)File 144:Pascal

11348925 PASCAL No.: 94-0171313
Raman scattering and x-ray diffractometry studies of epitaxial TiO SUB 2 and VO SUB 2 thin films and multilayers on alpha -**Al** SUB 2 **O** SUB 3 (112 SUP - 0)
FOSTER C M; CHIARELLO R P; CHANG H L M; YOU H; ZHANG T J; FRASE H; PARKER J C; LAM D J
Argonne national lab., materials sci. div., Argonne IL 60439, USA
Journal: Journal of applied physics, 1993, 73 (6) 2841-2847
Language: English
Epitaxial thin films of TiO SUB 2 and VO SUB 2 single layers and TiO SUB 2 /VO SUB 2 multilayers were grown on (1120) **sapphire** (alpha - **Al** SUB 2 **O** SUB 3) substrates using the metalorganic chemical vapor deposition technique and were characterized using Raman scattering and four-circle x-ray diffractometry. X-ray diffraction results indicate

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     FILE 'WPIX, JAPIO' ENTERED AT 15:39:15 ON 12 AUG 2002
L1            3 S (US4112157 OR US5880801 OR US5745205)/PN

     FILE 'DPCI' ENTERED AT 15:41:07 ON 12 AUG 2002
L2           19 S (US4112157 OR US5880801 OR US5745205)/PN.G,PN.D

     FILE 'WPIX, JAPIO' ENTERED AT 15:41:36 ON 12 AUG 2002

     FILE 'DPCI' ENTERED AT 15:41:51 ON 12 AUG 2002
                SET SMARTSELECT ON
L3          SEL L2 1- PN :       77 TERMS
                SET SMARTSELECT OFF

     FILE 'WPIX, JAPIO' ENTERED AT 15:42:00 ON 12 AUG 2002
L4           31 S L3
L5       114467 S ALUMINUM OXIDE OR ALUMINUM OXIDE OR AL203 OR ALUMINA TRIHYDRA
L6         4232 S PENTOXIDE OR C5H11O
L7       376583 S HYDROXIDE OR OH OR HYDROXY
L8            2 S L4 AND (L5-7)
L9          533 S HOMEOTROPIC?
L10      854099 S VERTICAL##
L11         184 S PERPENDICULAR ALIGN?
L12       88819 S ORIENTATION
L13          10 S (L5-7) AND L9
L14        2391 S (L5-7) AND L10
L15           2 S (L5-7) AND L11
L16        1248 S (L5-7) AND L12
L17          48 S L14 AND (LIQUID CRYSTAL OR LC OR L()C)
L18         266 S L16 AND (LIQUID CRYSTAL OR LC OR L()C)
L19          23 S L18 AND (DUCTILE OR ELASTIC? OR FLEXIBLE OR FLEXILE OR IMPRES
L20           3 S L17 AND (DUCTILE OR ELASTIC? OR FLEXIBLE OR FLEXILE OR IMPRES
L21          37 S L13 OR L15 OR L19 OR L20
                E COATES DAVID/AU
L22          26 S E3
                E PARRI OWAIN/AU
L23           1 S E4
                E WARD JEREMY LEWIS/AU
L24           1 S E3
                E JOICEY DAVID/AU
L25           3 S E2 OR E3
                E WILBOURN KEITH/AU
L26           9 S E1-3
                E DICKSON COLUM/AU
L27          13 S E1-3
                E SCOTT JOHN/AU
L28           5 S E3-5
L29          49 S L22-28
L30           0 S L29 AND (L5-7)
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L8 ANSWER 1 OF 2 WPIX (C) 2002 THOMSON DERWENT
AN 1990-295082 [39] WPIX
DNN N1990-226768 DNC C1990-127512
TI Liq. crystal display equipment - in which orientation membrane is made of **alumina** porous membrane.
DC L03 P81 U14
PA (NIHG) YAMAHA CORP
CYC 2
PI JP 02208633 A 19900820 (199039)* <--
US 5054889 A 19911008 (199143) <--
ADT JP 02208633 A JP 1989-29255 19890208; US 5054889 A US 1990-477229 19900208
PRAI JP 1989-29255 19890208
AB JP 02208633 A UPAB: 19930928
Liq. crystal display equipment is claimed where the orien membrane is made of an aluminium oxide tationorous membrane. The orientation membrane is treated by rubbing treatment.
USE/ADVANTAGE - SInce the orientation membrane is made of an aluminium oxide porous membrane, the liq. crystal mols. a penetrate into the micro pores of the orientation membrane and vertically oriented to the substrate. The regenerating capacity and stability of the orientation is assured, the quality is stabilised and the prodn. is easy. The liq. crystal display equipment has a rubbing treated orintateion membrane, i.e. the liq. crystal mols. are tended to be oriented in the horizontal direction, so that the pre-tilt angle can be controlled.
1,2/2

L8 ANSWER 2 OF 2 JAPIO COPYRIGHT 2002 JPO
AN 1990-208633 JAPIO
TI LIQUID CRYSTAL DISPLAY DEVICE
IN IMANISHI MASAO; OTAKA ATSUSHI; HIYAMA KUNIO; KAWAMURA TAKANORI
PA YAMAHA CORP, JP (CO 000407)
PI **JP 02208633** A 19900820 Heisei
AI JP1989-29255 (JP01029255 Heisei) 19890208
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: P, Sect. No. 1126, Vol. 14, No. 5, P. 123 (19901102)
AB PURPOSE: To attain molecular orientation of a large pretilt angle and to improve the reproducibility of orientation in a large area and the stability of the orientation by forming an oriented film of a porous film made of **aluminum oxide**.
CONSTITUTION: The oriented film 3 of the liquid crystal display device is formed of an anodized aluminum film and fine pores 7... opening in the surface are formed in this oriented film 3. Since the oriented film is formed of the porous film made of the **aluminum oxide** in such a manner, the liquid crystal molecules infilter the many fine pores (bore) 7 existing in the oriented film 3 and are oriented perpendicularly to a substrate. The liquid crystal, therefore, orients perpendicularly or obliquely. The liquid crystal display device which has the good reproducibility of the orientation and the good stability of the orientation even with the large area, is stabilized in quality and allows easy production is obtd. in this way.

L21 ANSWER 1 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 2001-611105 [70] WPIX
DNN N2001-456189 DNC C2001-182471
TI Liquid crystal-type reversible information display medium has recording layer comprising liquid crystal composition showing glass state at normal temperatures and dichroic dye as main components, for non-contact IC cards.
DC E19 L03 P76 P81 P85 T04 U14
IN HATANO, M; SANADA, S
PA (TOKM-N) TOKYO MAGNETIC PRINTING CO LTD; (TOKJ-N) TOKYO JIKI INSATSU KK; (HATA-I) HATANO M; (SANA-I) SANADA S
CYC 95
PI WO 2001057157 A1 20010809 (200170)* JA 55p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
JP 2001215533 A 20010810 (200170) 10p
JP 2001271069 A 20011002 (200172) 11p
AU 2001027108 A 20010814 (200173)
EP 1195423 A1 20020410 (200232) EN
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR
KR 2001110721 A 20011213 (200237)
US 2002076511 A1 20020620 (200244)
ADT WO 2001057157 A1 WO 2001-JP561 20010129; JP 2001215533 A JP 2000-26205 20000203; JP 2001271069 A JP 2000-85685 20000327; AU 2001027108 A AU 2001-27108 20010129; EP 1195423 A1 EP 2001-901558 20010129, WO 2001-JP561 20010129; KR 2001110721 A KR 2001-712670 20011004; US 2002076511 A1 Cont of WO 2001-JP561 20010129, US 2002-970162 20020116
FDT AU 2001027108 A Based on WO 200157157; EP 1195423 A1 Based on WO 200157157
PRAI JP 2001-14585 20010123; JP 2000-26205 20000203; JP 2000-85685 20000327; JP 2000-365014 20001130
AB WO 200157157 A UPAB: 20011129
NOVELTY - Liquid crystal-type reversible information display medium has a recording layer comprising a liquid crystal composition showing a glass state at normal temperatures and a dichroic dye as main components. The liquid crystal composition shows an isotropic liquid state or a liquid crystal domain state by applying heat and a **homeotropic** orientation state by applying both heat and electric field.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a non-contact IC card having a rewrite reversible information display part using the display medium and an antenna part bonded to the IC chip.

USE - Used as display sheets for rewritable paper and overhead projectors, display parts for magnetic cards, display parts for IC cards etc.

ADVANTAGE - The medium has excellent response properties, storability at high and low temperatures, water resistance, durability, falsification resistance etc. The display part of the recording medium can be used for a long time.

DESCRIPTION OF DRAWING(S) - The figure shows the laminate structure of the medium.

Substrate 2
Conductive Layer 3
Liquid Crystal Recording Layer 4
Protective Layer 5

Dwg.1/20

L21 ANSWER 2 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 2001-440071 [47] WPIX
CR 1999-204189 [17]
DNN N2001-325421
TI Liquid crystal display for portable computer, has liquid crystal material which is **homeotropically** and homogeneously aligned within pores of aluminum film and near top substrate.
DC P81 U14
IN DROLET, J P; PSALTIS, D; SCHERER, A
PA (CALY) CALIFORNIA INST OF TECHNOLOGY
CYC 1
PI US 6208398 B1 20010327 (200147)* 9p
ADT US 6208398 B1 Cont of US 1996-612382 19960307, US 1998-99714 19980619
FDT US 6208398 B1 Cont of US 5880801
PRAI US 1996-612382 19960307; US 1998-99714 19980619
AB US 6208398 B UPAB: 20010822
NOVELTY - An aluminum film (60) which is partially anodized to form **aluminum oxide** (62), is formed on the surface of bottom substrate. A liquid crystal material (66) **homeotropically** aligns within the pores of film and homogeneously aligns near the top substrate which covers the liquid crystal material.
USE - For use in digital watches, calculators, portable television sets and portable computer.
ADVANTAGE - Easier to align, offers analog phase and amplitude modulation at low voltages, cheaper manufacturing cost for liquid is achieved by **homeotropically** aligning the liquid crystal material within the pores of the aluminum film.
DESCRIPTION OF DRAWING(S) - The figure shows the exploded view of porous material with **homeotropic** alignment of liquid crystals.
Aluminum film 60
Aluminum oxide 62
Liquid crystal material 66
Dwg.2/5

L21 ANSWER 3 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 2000-317183 [27] WPIX
DNN N2000-238090 DNC C2000-095876
TI Preparation of functional film, for liquid crystal display element, comprises chemisorption of hydrolyzable compound onto siloxane containing substrate.
DC A85 E11 L03 U11 U14
IN NOMURA, T; OGAWA, K; OTAKE, T; TAKEBE, T
PA (MATU) MATSUSHITA DENKI SANGYO KK; (MATU) MATSUSHITA ELECTRIC IND CO LTD
CYC 7
PI WO 2000015428 A1 20000323 (200027)* JA 107p
RW: DE FR GB
W: CN KR US
JP 2001138434 A 20010522 (200134) 30p
EP 1153740 A1 20011114 (200175) EN
R: DE FR GB
CN 1318010 A 20011017 (200213)
KR 2001085389 A 20010907 (200218)
ADT WO 2000015428 A1 WO 1999-JP5059 19990916; JP 2001138434 A JP 1999-260096 19990914; EP 1153740 A1 EP 1999-943374 19990916, WO 1999-JP5059 19990916; CN 1318010 A CN 1999-810979 19990916; KR 2001085389 A KR 2001-701918 20010214
FDT EP 1153740 A1 Based on WO 200015428

PRAI JP 1999-246661 19990831; JP 1998-262031 19980916
AB WO 200015428 A UPAB: 20000606
NOVELTY - Undercoating layer is obtained from a hydrolyzable compound, bonded via siloxane groups on the substrate and -OSi groups in the film.

DETAILED DESCRIPTION - Functional film comprises an undercoating layer formed on a substrate surface as a thin film, which is obtained from a hydrolyzable compound of formula (I) by fixing onto the substrate through siloxane bound to contain structural units of formula (II), and a film derived from a collective groups of silane compound molecules with molecular terminal containing -OSi bonding groups so that the undercoating layer can be chemically linked to it through chemisorption.

X-(SiOX2)n-SiX3 (I)

X = halo, alkoxy and/or isocyanate

n = not less than 0

INDEPENDENT CLAIMS are also included for the following:

(i) a similar functional film comprising an undercoating layer formed on a substrate surface which is obtained from a hydrolyzable compound of formula (III) by fixing onto the substrate through -O-Al bond to contain structural units of formula (IV), and a thin film derived from a collective groups of silane compound molecules with molecular terminal containing -OSi bonding groups so that the undercoating layer can be chemically linked to it through chemisorption;

(ii) another functional film comprising an undercoating layer formed on a substrate which is obtained from a hydrolyzable compound of formula (I) and another hydrolyzable compound of formula (III), and a thin film derived from a collective groups of silane compound molecules with molecular terminal containing -OSi bonding groups so that the undercoating layer can be chemically linked to it through chemisorption;

(iii) preparing a functional film by applying an undercoating layer solution of the silane compound of formula (A) or/and a compound of formula (B) to a substrate surface before drying to give the undercoating layer, applying a film forming solution containing a silane to the undercoating layer surface to render molecules of the silane compound to be adsorbed chemically onto the substrate surface as a thin film, and calcination of the resultant substrate; and

(iv) producing liquid crystal display elements by making a liquid-crystal element from a pair of substrates installed with a liquid crystal alignment film on at least 1 of the inner surfaces as liquid crystal cell for filling liquid crystals, followed by forming one of the functional films on the substrate surfaces.

X1-(Al-OX1)n-AlX12 (III)

USE - Modifies substrate surface, e.g., in producing liquid crystal display elements, particularly an in-plane switching type liquid-crystal display element (claimed).

ADVANTAGE - The functional film has improved density, strength, water repellency, durability and resistance to water.

DESCRIPTION OF DRAWING(S) - Diagram illustrating the process of producing the required functional film on a glass plate as substrate.
Dwg.1/18

L21 ANSWER 4 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 2000-224799 [19] WPIX
DNN N2000-168368 DNC C2000-068831
TI Fabrication of non-Lambertian diffuser utilizes mechanical method instead of holographic.
DC A89 P81
IN KOSTRZEWSKI, A A; SAVANT, G D; YU, K H
PA (PHYS-N) PHYSICAL OPTICS CORP
CYC 24

PI WO 2000011499 A1 20000302 (200019)* EN 24p
RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
W: CA CN JP KR
US 2001001459 A1 20010524 (200130)
US 2001002355 A1 20010531 (200131)
US 6241903 B1 20010605 (200133)
EP 1114338 A1 20010711 (200140) EN
R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
US 2001038492 A1 20011108 (200171)
KR 2001072793 A 20010731 (200209)
CN 1321253 A 20011107 (200216)
ADT WO 2000011499 A1 WO 1999-US19293 19990820; US 2001001459 A1 Div ex US 1998-137398 19980820, US 2001-759773 20010112; US 2001002355 A1 Div ex US 1998-137398 19980820, US 2001-759387 20010112; US 6241903 B1 US 1998-137398 19980820; EP 1114338 A1 EP 1999-945169 19990820, WO 1999-US19293 19990820; US 2001038492 A1 Div ex US 1998-137398 19980820, US 2001-759388 20010112; KR 2001072793 A KR 2001-702146 20010220; CN 1321253 A CN 1999-811681 19990820
FDT EP 1114338 A1 Based on WO 200011499; US 2001038492 A1 Div ex US 6241903
PRAI US 1998-137398 19980820; US 2001-759773 20010112; US 2001-759387 20010112; US 2001-759388 20010112
AB WO 200011499 A UPAB: 20000419
NOVELTY - Non-Lambertian diffuser is produced mechanically by providing a substrate body having a first side, selecting a buffing agent with a desired grit and buffing the first side to form several irregularities that defines a diffuser surface. The diffuser surface exhibits light propagating characteristics defined by the **orientation**, contour and depth of several irregularities.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(A) a method of fabrication of a non-Lambertian diffuser using a substrate which is etched by an acid or an alkali to form irregularities in the first side;

(B) a method of fabrication of a non-Lambertian diffuser using a substrate which is blasted with shot particles; and

(C) a non-Lambertian diffuser.

USE - For the fabrication of non-Lambertian diffuser.

ADVANTAGE - The master diffuser is durable which is suitable for use under extreme temperature conditions such as adjacent a high temperature active light source in a **liquid crystal** display. The method of fabrication provides fewer steps for creating the diffuser and the cost of material and labor are reduced.

Dwg.0/7

L21 ANSWER 5 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 2000-125635 [11] WPIX
DNN N2000-094652 DNC C2000-038142
TI Transistors used as components in devices and articles such as **liquid crystal** display devices, notebook personal computers, calculators and watches.
DC A23 A85 L03 U12
IN SHEN, S S; SUH, S Y
PA (FARH) HNA HOLDINGS INC
CYC 1
PI US 5998804 A 19991207 (200011)* 7p
ADT US 5998804 A US 1997-888022 19970703
PRAI US 1997-888022 19970703
AB US 5998804 A UPAB: 20000301
NOVELTY - A transistor comprises an organic substrate (10) and a semiconducting material (20). The substrate comprises aromatic

thermotropic liquid crystalline polymer (LCP) which comprises polyester of 4-hydroxybenzoic acid and 6-hydroxynapthoic acid repeating units.

USE - As components in **flexible** devices and articles such as **liquid crystal** display devices, notebook personal computers, calculators, watches, **liquid crystal** color televisions, toys, word processors.

ADVANTAGE - The transistor fabricated on a substrate comprising LCP paves way to bring down processing temperatures when using with organic semiconductor material. Since the LCPs are easily oriented, bonding between LCP-based substrate and semiconductor layer is good, the semiconductor layer easily maintains is **orientation**.

DESCRIPTION OF DRAWING(S) - The figure shows cross-section view of a transistor i.e. Field Effect Transistors (FET).

Substrate 10

Semiconducting material layer 20

Dwg.1/1

L21 ANSWER 6 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1999-204189 [17] WPIX
CR 2001-440071 [25]
DNN N1999-150392
TI Hybrid aligned liquid crystal display (LCD).
DC P81 U11 U14
IN DROLET, J P; PSALTIS, D; SCHERER, A
PA (CALY) CALIFORNIA INST OF TECHNOLOGY
CYC 1
PI US 5880801 A 19990309 (199917)* 11p
ADT US 5880801 A US 1996-612382 19960307
PRAI US 1996-612382 19960307
AB US 5880801 A UPAB: 20010822

NOVELTY - A porous **aluminum oxide** layer (62) on the surface of a substrate (44) has elongated pores (68) which are perpendicular to the substrate surface. A liquid crystal material (40) comprised of elongated molecules (66) overlies the porous layer and resides within the pores so that the molecules are **homeotropically** aligned.

DETAILED DESCRIPTION - The porous **aluminum oxide** layer is formed by partially anodizing an aluminum film in an acidic electrolyte so that the porous layer is formed on it. INDEPENDENT CLAIMS are included for:

(1) a method for creating **homeotropic** alignment,

(2) a hybrid aligned nematic cell on an integrated circuit,

(3) a method for creating a hybrid aligned nematic cell on an integrated circuit,

(4) a device having **homeotropically** aligned liquid crystals, and

(5) a liquid crystal display.

USE - Applications of this invention include optical information storage and processing systems, optoelectronic neuromorphic systems, displays, and electrically programmable diffractive optical elements and beam shaping devices. Devices fabricated in accordance with the invention include reflective liquid crystal-on-silicon (LCOS) spatial light modulators and smart pixel arrays capable of analog phase and amplitude modulation at low driving voltages, and electrically programmable high resolution beam steering devices.

ADVANTAGE - Allows liquid crystal devices to be fabricated on the surface of integrated circuits because of their compatibility with aluminum. Allows the use of thicker hybrid aligned nematic (HAN) cells such as 4 to 10 microns. Reduces the effect of the roughness of the

substrate surface. Provides better alignment quality, contrast and light efficiency.

DESCRIPTION OF DRAWING(S) - The drawings show a cross sectional view of the behavior of the liquid crystal molecules and an exploded view the porous **aluminum oxide** layer inducing **homeotropic** alignment of the liquid crystals.

liquid crystal material 40
substrate 44
aluminum film 46,60
aluminum oxide layer 48,62
liquid crystals 66
pores 68
Dwg.1,2/5

L21 ANSWER 7 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1998-508446 [44] WPIX
DNC C1998-153478
TI **Liquid crystal** polymer production compound(s) e.g. for paint(s) - comprise special monomers with two or more polymerisable mesogenic units linked together by linear or branched spacers, e.g. tetra ethylene glycol units.
DC A12 A23 A41 A82 E19 G02
IN DANNENHAUER, F; GAILBERGER, M; HOLDIK, K; KUERSCHNER, K; STOHR, A; STRELZYK, K; STROHRIEGL, P
PA (DAIM) DAIMLER-BENZ AG; (DAIM) DAIMLERCHRYSLER AG
CYC 26
PI EP 869112 A1 19981007 (199844)* DE 23p
R: AL AT BE CH DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
DE 19714119 A1 19981008 (199846)
JP 10310612 A 19981124 (199906) 18p
US 6303050 B1 20011016 (200164)
ADT EP 869112 A1 EP 1998-104771 19980317; DE 19714119 A1 DE 1997-19714119 19970405; JP 10310612 A JP 1998-128024 19980403; US 6303050 B1 Div ex US 1998-55303 19980406, US 1999-465776 19991217
PRAI DE 1997-19714119 19970405
AB EP 869112 A UPAB: 19990511
Compounds of formula C-Am (I) used as nematic phases in cholesteric **liquid crystal** (**LC**) polymers, in which m at least 2 ;(a) if m = 2, C = a group of formula CnH2n; where n = 1-40 and one or more CH2 groups may be replaced by oxygen atoms or one or more hydrogens may be replaced by 1-20 C alkyl or alkoxy groups;

(b) if m at least 2, (i) C = a branched, poly- functional group selected from oligo-propylene oxide, oligo- butylene oxide, 4-40 C branched alkyl, trimethylolpropane, penta- erythritol, cyclohexane-tricarboxylic acid, cyclohexanetriol, aromatic acids with 2 or more carboxyl groups and phenols with 2 or more hydroxyl groups; or

(ii) C = a composition of one or more of these compounds and/or groups of formula CnH2n, where n = 1-40 and one or more CH2 groups may be replaced by O;

A = a group of formula -Y-B-M-; where Y = a polymerised residue; B = CnH2n, in which n = 0-20 and one or more CH2 may be replaced by O; and

M = -R1-X1-R2-X2-R3-X3-R4-X4-;

(where: R1-R4 = -O-, -COO-, -CONH-, -CO-, -S-, -C triple bond C-, -CH=CH-, -CH=N-, -CH2-, -N=N- or -N=N(O)-, or the group -R2-X2-R3-, -X3-R4- or -R2-X2-R3-X3- may be a single bond;

X1, X2, X3 = 1,2-, 1,3- or 1,4-phenylene, 1,4-cyclohexene, arylalkane or heteroaryl- alkane substituted with B1, B2 and/or B3, containing 1-3 O, N and/or S atoms and with 6-10 atoms in the aromatic ring, or 3-10C

cycloalkylene substituted with B1, B2 and/or B3; (where: B1-B3 = H, 1-20C alkyl, alkoxy, alkylthio, alkylcarbonyl, alkoxycarbonyl or alkylthiocarbonyl, **OH**, F, Cl, Br, I, CN, NO2, cycloalkyl, formyl, or 1-20C alkyl, alkoxy or alkylthio groups, optionally with in-chain -O-, -S- or ester links.)

Also claimed is (i) a process for the production of **LC** polymers from compounds (I) by polymerisation of groups Y;

(ii) **LC** polymers obtained from (I) and/or by this process.

USE - **LC** polymers based on compounds are used, e.g. for the production of polymer coatings and special-effect paints.

ADVANTAGE - Compounds are monomers with a definite structure and a molecular weight in the oligomeric range (1000-3000); however, in spite of this, they show a low viscosity and are therefore easily oriented in the **LC** phase, with **orientation** being ''frozen in'' by crosslinking.

Compared with conventional monomers, compounds show an equally good helical twisting power (HTP; especially for ''twin nemats'' with m = 2 and ''stellar nemats'' with m = 3) and better handling and application properties, with a greater range of variation and better control of the composition and properties of the resulting **LC** polymers, i.e. flow, film-forming properties, solubility, colour, gloss, adhesion, **elasticity** etc..

Dwg.0/8

L21 ANSWER 8 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1998-005568 [01] WPIX
DNN N1998-004406 DNC C1998-002099
TI Liquid crystal alignment agent - contains polymer selected from polyamic acid and imide polymer having structure obtained by ring closure of polyamic acid, and e.g. a nitrogen-containing heterocycle.
DC A85 E19 L03 P81 U14
PA (JAPS) NIPPON GOSEI GOMU KK
CYC 1
PI JP 09274190 A 19971021 (199801)* 17p
ADT JP 09274190 A JP 1996-104593 19960403
PRAI JP 1996-104593 19960403
AB JP 09274190 A UPAB: 19980107

A liquid crystal alignment agent contains: (a) at least 1 polymer selected from polyamic acid, and an imide polymer having a structure obtained by applying dehydration ring closure to the polyamic acid, and (b) at least 1 compound selected from compounds of formulae (I)-(IV) and HC(**OH**)(R17)-(CHR18)e-CH(**OH**)(R19) (V).

In the formulae, R1-R10 = H, or 1-12C hydrocarbon groups; a-e = 0-4.

USE - The liquid crystal alignment agent is used in forming a liquid crystal alignment layer used in a twisted nematic liquid crystal display device, super twisted nematic liquid crystal display, device, super **homeotropic** liquid crystal display device, in-plane switching liquid crystal display device, ferroelectric liquid crystal display device.

ADVANTAGE - The liquid crystal alignment agent forms a film having no film separation, and superior toughness on the electrode surface of an transparent electrode substrate without lapping. The liquid crystal alignment layer formed by applying lapping treatment to the surface of the film promptly discharges and attenuates static electricity. The resulting liquid crystal display device has low residual voltage to yield superior high-contrast display performance, and has less after image.

Dwg.0/0

L21 ANSWER 9 OF 37 WPIX (C) 2002 THOMSON DERWENT

AN 1997-372107 [34] WPIX
DNC C1997-119871
TI High molecular weight photosensitive resin production - comprising reacting di amine with tetra-carboxylic acid tetra-ester, giving resin of high sensitivity and good cured film characteristics.
DC A23 A26 A89 G06 L03
IN BANBA, T; SASHIDA, N; TAKEDA, N
PA (SUMB) SUMITOMO BAKELITE CO LTD
CYC 1
PI US 5648451 A 19970715 (199734)* 7p
ADT US 5648451 A US 1995-541582 19951010
PRAI US 1995-541582 19951010
AB US 5648451 A UPAB: 19970820
Production of a photosensitive resin comprises reacting a diamine with a tetracarboxylic acid tetraester of formula (I) at 0-50 deg. C in an aprotic polar solvent. In (I), R1 = tetravalent group; R2 has the formula -O-R5-(O-C(O)-C(R6)=CH2)p (II); R5 = divalent to hexavalent organic group; R6 = H or CH3; p = 1-5; R3 = -OCH3, -OC2H5, -OC3H7 or has the formula (II) above; R4 has the formula (III).

The tetracarboxylic acid tetraester of formula (I) is obtained by subjecting to addition reaction a tetracarboxylic dianhydride, an alcohol compound of formula R2H and an alcohol compound of formula R3H and subjecting the product to dehydration-condensation with 1-**hydroxy** -1,2,3,7-benzotriazole using a carbodiimide compound as a condensation agent.

USE - This photosensitive resin composition is useful in semiconductors, and also as an interlaminar insulation film of a multilayer circuit, a cover coat of a **flexible** copper-clad laminate, a solder resist film, a crystal liquid **orientation** film or the like.

ADVANTAGE - This process produces a high molecular weight photosensitive resin having a high sensitivity and excellent cured film characteristics. The use of a photosensitised polyimide film in the preparation of semiconductor devices gives a simplified pattern forming step and a process that is safe and low in environmental pollution because it is not necessary to use an etching solution.
Dwg.0/0

L21 ANSWER 10 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1995-312595 [41] WPIX
DNN N1995-236223 DNC C1995-139173
TI Cone-type calix (4) resorcinarene cpds. - prepd. by reacting resorcinol with aldehyde in presence of acid catalyst, useful as surface reforming agents.
DC A60 E14 G08 L03 M22 P42
IN ICHIMURA, K; KURITA, E; UEDA, M
PA (TODA) TODA KOGYO CORP; (TODA) TODA KOGYO KK; (TOKU) TOKUYAMA SODA KK
CYC 6
PI EP 671220 A1 19950913 (199541)* EN 29p
R: DE FR GB NL
JP 07252177 A 19951003 (199548) 14p
JP 07252188 A 19951003 (199548) 9p
US 5688998 A 19971118 (199801) 17p
EP 671220 B1 19990714 (199932) EN
R: DE FR GB NL
DE 69510705 E 19990819 (199939)
JP 3226194 B2 20011105 (200172) 10p
JP 3226195 B2 20011105 (200172) 14p
ADT EP 671220 A1 EP 1995-301590 19950310; JP 07252177 A JP 1994-67757

19940311; JP 07252188 A JP 1994-67756 19940311; US 5688998 A US 1995-401499 19950310; EP 671220 B1 EP 1995-301590 19950310; DE 69510705 E DE 1995-610705 19950310, EP 1995-301590 19950310; JP 3226194 B2 JP 1994-67756 19940311; JP 3226195 B2 JP 1994-67757 19940311

FDT DE 69510705 E Based on EP 671220; JP 3226194 B2 Previous Publ. JP 07252188; JP 3226195 B2 Previous Publ. JP 07252177

PRAI JP 1994-67757 19940311; JP 1994-67756 19940311

AB EP 671220 A UPAB: 19960422

Cone-type calix (4) resorcinarene cpds. of formula (I) are new. R = 3-18C alkyl, alkenyl or aralkyl, or an opt. substd. aryl; R1 = H, 2-4C carboxyalkyl or hydroxyalkyl. Also claimed are cone-type calix (4) resorcinarene cpds. of formula (Ia). R2 = 2-4C carboxyalkyl.

USE - Surface reforming agents are used for improving and controlling properties, e.g. electric charging properties, electro-conductivity, anti-corrosiveness, hydrophilic or hydrophobic properties; for increasing the functional efficiency of composite materials by controlling the interface between materials arising from complexing; and esp. for prepn. of magnetic toners. The prods. are useful for surface reforming materials pref. having a polar surface (claimed), e.g. powders, particles and mouldings of metals (claimed), e.g. metals and alloys of Fe, Cu, Ti, Al and Ni; inorganic substances (claimed), e.g. kaolin, talc, carbon black, molybdenum sulphide, gypsum, barium sulphate, LiF,CaF2, zeolite, calcium phosphate and calcium carbonate; silicon dioxides, e.g. silica (claimed) and quartz. metal oxides (claimed), e.g. iron oxide (claimed), zinc oxide, titania, **alumina** and ferrite; composite metal oxides (claimed) composed of silicon dioxides; and resins (claimed), e.g. polyvinyl alcohol, cellulose, polyamides, polyurethanes and polyimides.

ADVANTAGE - Dense monomolecular layers having **perpendicular alignment** are obtd. on, e.g. quartz and polyvinyl alcohol substrates, even at low concns. and the prods. are capable of inducing rapid **homeotropic** alignment of liq. crystal materials in contact with the treated substrates. High levels of adsorption onto substrates are obtd. and the prods. are simply prepd. in high yields, e.g. 97%.

Dwg.0/4

L21 ANSWER 11 OF 37 WPIX (C) 2002 THOMSON DERWENT

AN 1995-239978 [31] WPIX

CR 1993-303674 [38]; 1996-087005 [09]; 1996-505333 [50]

DNN N1995-187174 DNC C1995-110022

TI Low hysteresis encapsulated liq. crystal structures - contg. non-ionic surfactant additives, useful in active matrix displays for television, computer and instrument screens..

DC A85 L03 P81 U14

IN ATKINS, H; DRZAIC, P S; HAVENS, J; LAU, A N K; MONTOYA, W; REAMEY, R H; STRAIN, J; TOMITA, A; WARTENBERG, M F; WELSH, L; WOJTOWICZ, J

PA (RAYC) RAYCHEM CORP

CYC 1

PI US 5427713 A 19950627 (199531)* 29p

ADT US 5427713 A CIP of US 1992-850378 19920310, US 1993-28497 19930309

PRAI US 1993-28497 19930309; US 1992-850378 19920310

AB US 5427713 A UPAB: 19961219

Liq. crystal devices having reduced operating field E90, comprises: (A) a first electrode; (B) a second electrode, at least one of the first and second electrodes being transparent; (C) an encapsulated liq. crystal structure between the electrode, comprising:

(a) a containment medium;

(b) a liq. crystal compsn. dispersed in the medium;

(c) additive means, comprising (I) or (II) where: (I) is a cpd. having polar functionality, chosen from **OH**, carbonyl, carboxylic acid,

ester and nitro groups, and further having at least one 3-15 C branched alkyl gp. contg. at least two Me gps.; and (II) is a reactive additive chosen from silane coupling agents having acrylic or methacrylic functionality; acrylic or methacrylic cpds., epoxy cpds., aldehydes and thiol cpds. which reduce the operating field E90 of the device by at least 10%.

At least one of the following conditions is fulfilled: (i) the liq. crystal compsn. is free of dye and in the formula (I):

[CRdivided by(V90.(f/#)2)] 0.11 (I)

CR = the contrast ratio of the device; V90 = the operating voltage; f/# = an f/number of 3.5-15 for the measurement optics used to determine the contrast ratio at 400-700 nm; (ii) the voltage holding ratio of the device is at least 50%; (iii) the encapsulated liq. crystal structure further comprises a pleochroic dye dissolved in the liq. crystal material and the fraction of formula (II) is at least 10% greater than would be the case if the additive was absent:

(Ton)2 divided by (Toff.V90) (II)

Ton = max. transmission of the device in the presence of an applied sufficient voltage; Toff = transmission of the device in the absence of any applied voltage; (iv) the device has a clearing point of no more than 20 deg.C less than that of a device not contg. the additive; (v) in formula (III):

(Emax-Emin) divided by Eavg < 0.30 (III)

Eavg, Emaz and Emin = average, max. and min. values, respectively of the operating field E90 at 10-55 deg.C; (vi) the contact angle between the liq. crystal compsn. and the containment medium is more than 5deg. greater than the contact angle found in a system not employing the additive; (vii) the hysteresis of the liq. crystal device is at least 20% less than the hysteresis of a device not including the additive; (viii) the additive is a non-ionic surface active agent having sufficient activity to lower the surface tension of water by more than 10 dyne/cm when used in an amt. of 2 wt.%; (ix) a film of the encapsulated liq. crystal structure has a wide-angle x-ray diffraction spectrum in which the scattering angle 2theta value at 14-20deg. is at least 20% less than that of a liq. crystal structure in which the additive is absent; (x) the additive causes a larger decrease in the operating field R90 as the vol. medium cavity diameter is decreased. Also claimed is a pref. liq. crystal device, in which the encapsulated liq. crystal structure has a **homeotropic** transition temp. Th of less than 5 deg.C.

USE - The additive contg. compsns. are partic. useful in active matrix displays for television, computer and instrument screens.

ADVANTAGE - The device has rise and fall times at least 10% faster than in that of a device in which the additive is absent (claimed).

Dwg.0/10

L21 ANSWER 12 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1993-201328 [25] WPIX
DNN N1993-154410 DNC C1993-089815
TI Photosensitive resin compsn. with improved sensitivity for semiconductor - contg. polyamide acid ester, N-phenylglycine and its deriv. and thiol cpd..
DC A28 A85 A89 G06 L03 P84 U11 U14 V04
PA (SUMB) SUMITOMO BAKELITE CO
CYC 1
PI JP 05127384 A 19930525 (199325)* 10p
JP 2693670 B2 19971224 (199805) 2p
ADT JP 05127384 A JP 1991-289589 19911106; JP 2693670 B2 JP 1991-289589 19911106
FDT JP 2693670 B2 Previous Publ. JP 05127384

PRAI JP 1991-289589 19911106
AB JP 05127384 A UPAB: 19931118
Compsn. contains (a) polyamide acid ester of formula (1), N-phenylglycine of formula (2) and its deriv. and (C) thiol cpds. as the essential components. In (I), R1 = 3 or 4-valent organic gp.; R = divalent organic gp.; R3 = gp. of formula (1a); R4 = gp. of formula (Ia), -CH3 or -C2H5; R5 = 2-6-valent organic gp.; R6 = H or CH3; l, m, n = 0 or 1; p = integer of 1-5; x, y = 0-100; z = 0-8 and x+y+z = 100. In (2), R7 = -H, -CH3, -C2H5, -OCH3, -Cl, -NO2, -N(CH3)2, -Br, -COCH3 or **OH**.

Pref. cpd. (C) is a cpd. of formula (3) and/or (4). The compsn. consists of 100 pts.wt. of (A), 3-15 pts.wt. of (B) and 0.3-3 pts.wt. of (C). In (4), R8 = -O-, -S- or -NH-.

USE/ADVANTAGE - The compsn. is for a semiconductor, an interlayer insulating film, a covering coat for a **flexible** copper-lined plate, soldering resist film, an **orientation** film for a **liq. crystals**, etc. The addn. of the N-phenylglycine and its deriv. and thiol cpds. easily initiates the optical radical reaction in good efficiency and this improves the sensitivity. The compsn. little changes in the viscosity at room temp. by addition of the thiol cpds.

In an example, 65.5g pyromellitic dianhydride and 225.5g 3,3',4,4'-benzophenone tetracarboxylic dianhydride were esterified with 456g 2-**hydroxy**-1,3-dimethacryloxypropane and then condensed with 4,4'-diaminodiphenylether with 170.2g dicyclohexylcarbodiimide as a condensing agent to obtain polyamide acid ester copolymer. After the dicyclohexylurea had been filtered out, the deposits were recrystallised from ethanol and dried under vacuum. The polyimide acid ester obtd., 100 pts.wt., 6 pts.wt. N-phenylglycine, 1 pt.wt. 1-phenyl-5-mercapto-1H-tetrazole, 10 pts.wt. tetraethyleneglycol dimethacrylate and 0.1 pt.wt. methylether hydroquinone were dissolved in 150 pts.wt. N-methyl-2-pyrrolidone to obtain the photosensitive resin compsn. The compsn. was applied on a silicon wafer and dried at 70 deg.C for 1 hr. to obtain a coated film. The coated film had high sensitivity. The viscosity of the resin compsn. increased only +5% after storing at 23 deg.C for 1 month.

Dwg.0/0
Dwg.0/0

L21 ANSWER 13 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1992-081437 [11] WPIX
DNC C1992-037652
TI Pulp-like short fibres, useful esp. for paper prodn. - by melt-extrusion of **liq. crystal** polyester(s) to give highly-orientedmicro fibrils.
DC A23 F01 F09
IN CHO, J W; LEE, C J; MIN, B G; SON, T W; YOON, H S; SOHN, T; YOON, H
PA (KOAD) KOREA INST SCI & TECHNOLOGY; (KOAD) KIST KOREA INST SCI & TECHNOLOGY; (KORE-N) KOREA RES INST CHEM TECHNOLOGY; (KOAD) KOREA ADV INST SCI & TECHNOLOGY
CYC 4
PI DE 4128943 A 19920305 (199211)* 19p
KR 9305104 B 19930615 (199402)
DE 4128943 C2 19940303 (199408) 16p
JP 06341014 A 19941213 (199509) 18p
US 5454910 A 19951003 (199545) 15p
ADT DE 4128943 A DE 1991-4128943 19910830; KR 9305104 B KR 1990-13481 19900830; DE 4128943 C2 DE 1991-4128943 19910830; JP 06341014 A JP 1991-240262 19910828; US 5454910 A Cont of US 1991-753357 19910830, Cont of US 1992-995917 19921222, US 1994-303878 19940909
PRAI KR 1990-13481 19900830

AB DE 4128943 A UPAB: 19940126
Dwg.0/3
Pref. (II) are copolyesters of **hydroxy**-aromatic esters, aromatic diols aromatic diacids, and aliphatic diols (25 compsns. listed contg. many possible combinations of the above cpds. e.g. 20-80 mols. p-**hydroxy**-benzoic acid (III) and 20-80 mols. m-hydroxybenzoic, 2-hydroxynaphthalene -6-carboxylic (IV) 4'-**hydroxy**-4-bi phenylcarboxylic, 4-hydroxyphenyl-acetic, 4-hydroxyphenyl-propionic and/or 2-(4-carboxy-phenoxy)-ethanol, pref. e.g. 30-70 mols. (III) and 30-70 mols. (IV)). (II) form anisotropic melts at 220-360 deg.C and have mol. wt. 5000-50,000 (I) have tensile strength 10-25 g/den modulus, 300-1000 g/den angle of **orientation** below 20 deg.C thickness 0.1-20 microns, length 0.1-20mm, specific surface, 5-20m2/g.
USE/ADVANTAGE - The method provides pulp-like short fibres with mol. **orientation**, which can be produced without spinning, by applying shear forces to a **LC** melt at relatively low temp. (e.g. in an extruder) and making use of the spontaneous **orientation** properties of the **LC** material the prod. have the above desirable properties and are easily processed to give paper.
0/3

L21 ANSWER 14 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1991-111091 [16] WPIX
DNN N1991-085697 DNC C1991-047704
TI Malonic acid dyestuff cpds. and liq. crystalline dyestuff cpds. - with high stability to heat and light and high dichroism.
DC A60 E24 L03 U11 V07
IN BECK, K H; ETZBACH, K H; WAGENBLAST, G; ETZBACH, K
PA (BADI) BASF AG
CYC 8
PI EP 422538 A 19910417 (199116)*
R: CH DE FR GB IT LI
DE 3934190 A 19910418 (199117)
JP 03134066 A 19910607 (199129)
US 5162545 A 19921110 (199248) 19p
EP 422538 B1 19940309 (199410) DE 34p
R: CH DE FR GB IT LI
DE 59004886 G 19940414 (199416)
ADT EP 422538 A EP 1990-119209 19901006; DE 3934190 A DE 1989-3934190 19891013; JP 03134066 A JP 1990-270679 19901011; US 5162545 A US 1990-596385 19901012; EP 422538 B1 EP 1990-119209 19901006; DE 59004886 G DE 1990-504886 19901006, EP 1990-119209 19901006
FDT DE 59004886 G Based on EP 422538
PRAI DE 1989-3934190 19891013
AB EP 422538 A UPAB: 19930928
New malonic acid dyestuffs (I) and new liq. crystalline dyestuffs (II) are of the formula (I) and (II). In formula R1 and R2 = **OH**, 1-6C alkoxy, Cl, or Br, R3 = H or 1-6C alkyl, Z = A-CHr or a gp. of formula (III), A = 1-20C alkylene, opt. O atom(s) or -NH- or 1-4C alkylamino gp(s) in the chain, Chr = the radical of a chromophore derived from an anthraquinone, perylene, disazo or trisazo dyestuff, or, if R3 = 1-6C alkyl, also from a monoazo dyestuff, B1 = a chemical bond, ethylen, methylenoxy or 1,4-phenylene, T3 = 1-6C alkoxy, NO2, or CN, T4 = H, 1-4C alkyl or halogen, E = -O-V2-O-, B2 = 2-12C alkylene, 1,4-xyxylene, 1,4-cyclohexylidene or a gp. of formula (IVA) or (IVB), x and y independently = 2-12, T1 and T2 independently = **OH**, 1-6C alkoxy or E-H, and m = 1-200.
USE/ADVANTAGE - (I) can be polycondensed without problems and have good compatability with a polymer matrix. The polycondensed dyestuff have

very high stability to heat and light and high dichroism. When incorporated in liq. crystalline polymers, they have little effect on the properties of the liq. crystalline matrix, e.g. clear point, phase ratio, viscosity or development of homogeneous planar or **homeotropic** texture. Displays contg. (I) have a great switching range and fast switching times.
0/0

L21 ANSWER 15 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1990-326146 [43] WPIX
DNN N1990-249487 DNC C1990-141627
TI **Liq. crystal** polymer base board - has monomer stuck on baseboard and polymerised to give thin membrane of **liq. crystal** polymer.
DC A25 A89 G06 L03 P81 T03 T04 W04
PA (CANO) CANON KK
CYC 1
PI JP 02235935 A 19900918 (199043)*
JP 2614106 B2 19970528 (199726) 6p
ADT JP 02235935 A JP 1989-56028 19890310; JP 2614106 B2 JP 1989-56028 19890310
FDT JP 2614106 B2 Previous Publ. JP 02235935
PRAI JP 1989-56028 19890310
AB JP 02235935 A UPAB: 19930928
Monomer component of **liq crystal** polymer is stuck on the base board and polymerised to give thin membrane of the **liq-crystal** polymer. Functional gps of the polymer chain terminal are reacted with monomolecular cpd by heating or radiating plasma, UV ray or electronic ray.

Polymerisation is done using heating, plasma, UV rays or electronic ray. The board is pref **orientation** treated before the monomer component is stuck on. Monomer component is stuck on the board by evapn, condensation or sublimation pref under 10 - power (-2) - 10 - power (-6) Torr vacuum. The terminal of the thin membrane polymer has **hydroxy**, carbonylchloride or carboxyl gps which are reacted with monofunctional monomolecular cpd such as phenylisocyanate to give the stable polymer. The base board is glass, metal or **plastics** or those with ditches 0.05-0.2 micron deep on their surface.

USE/ADVANTAGE - It is used as functional material of optical instruments etc, such as indicator, recording medium etc. Membrane has uniform thickness and is without any flaws and impurities. It has moisture, and environ resistance.
0/0

L21 ANSWER 16 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1990-202800 [27] WPIX
DNC C1990-087737
TI Liq.-crystalline aromatic polymer contg. amide-linked triazine - has improved strength perpendicular to direction of processing.
DC A23 F01
IN MINIACI, F; VRIESEMA, B K
PA (STAM) STAMICARBON BV
CYC 13
PI EP 376380 A 19900704 (199027)*
R: AT BE CH DE ES FR GB GR IT LI NL SE
NL 8803182 A 19900716 (199032)
JP 02227428 A 19900910 (199042)
ADT EP 376380 A EP 1989-203234 19891218; NL 8803182 A NL 1988-3182 19881228; JP 02227428 A JP 1989-336743 19891227
PRAI NL 1988-3182 19881228

AB EP 376380 A UPAB: 19930928
Aromatic liq.-crystalline polymer contains one or more 1,3,5-triazine unit of formula (I), where R1 = amino gp; R2,R3 are (alkyl)carboxy, (alkyl) **hydroxy** and/or amino gps. Polymer also contains monomers capable of forming a liq. crystalline polymer.

Pref. triazines are derived from melamine and/or cyanuric acid. Prepn. of, moulding cpd. and fibre prepd. from the polymer are also claimed.

Polymer pref. contains0.01-10 moles % triazine units, pref. 0.01-1 moles %, derived from melamine. Pref. polymer comprises: 0.01-10 moles % triazine, 20-70 moles % of a -O-Ar-C(=0)-unit, 5-40 moles % of a -O-Ar-O- unit and 5-40 moles % of -C(=O)-Ar-C(=O) unit where Ar = at least one phenyl gp. Pref. process comprises polymerising in the melt aromatic monomers until at most a 96% conversion has occurred, adding (I) and continuing the reaction for a short while. After-condensation may be carried out in the solid phase' at elevated temps. after cooling the prod.

USE/ADVANTAGE - Used as fibre or film e.g. in textile or and as articles for electrical engineering and aircraft industries. The amide-linked polymer has good mechanical properties in direction perpendicular to, and good modulus of **elasticity** parallel to, the direction of **orientation**.
0/0

L21 ANSWER 17 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1990-072552 [10] WPIX
DNC C1990-032121
TI Knitting needle having high bending **elastic** modulus - comprises **liq. crystal** polyester and PVC.
DC A14 A23 A86 A88 F04
PA (NIRA) UNITIKA LTD
CYC 1
PI JP 02026965 A 19900129 (199010)* 4p
ADT JP 02026965 A JP 1988-178741 19880718
PRAI JP 1988-178741 19880718
AB JP 02026965 A UPAB: 19930928
Knitting needle comprises 30-90 wt.% **liquid crystal** polyester and 70-10 wt.% of PVC. **Liquid crystal** polyester is constituted of 54-30 mol.% of ethylene terephthalate units and 46-70 mol.% of p-**hydroxy** benzoic acid residue unit.

Knitting needle is made esp. by extrusion moulding or injection moulding, providing good molecular **orientation**, processability and productivity. Extrusion moulding is at draft of 1.1-20 (1.2-7) to provide sufficient molecular **orientation**.

USE/ADVANTAGE - Knitting needle made with special **plastic** is useful for hand knitting. It has at least no less 125,000kg/cm2 highest bending **elastic** modulus, and is easy to colour and light, and has good stain proofing property.
0/1

L21 ANSWER 18 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1990-005325 [01] WPIX
DNN N1990-004062 DNC C1990-002445
TI **Liquid crystal** display device - uses glass fibre or **alumina** spacers at base plate peripheries, with **plastic** interfacial spacers between the base plates.
DC L03 P81 P85 U14
PA (MITQ) MITSUBISHI DENKI KK
CYC 1
PI JP 01289915 A 19891121 (199001)* 6p

ADT JP 01289915 A JP 1988-120930 19880517
PRAI JP 1988-120930 19880517
AB JP 01289915 A UPAB: 19930928
The **liquid crystal** display device comprises a base plate carrying on its surface a thin film transistor (TFT) array, a counter electrode base plate and a **liquid crystal** intervening between these base plates. An inorganic, hard spacer material of glass fibre or **alumina** is used in the sealant (applied) at the peripheries of these base plates, and **plastic** interfacial spacers are used between the base plates, with variations in the distribution density.
ADVANTAGE - The combination of two different spacer materials ensures reliable sealing with precise control of the gap. Thus troubles in the TFT array, such as redn. in its characteristics and exposing of **orientation** film over the pixel electrodes are prevented.
4/8

L21 ANSWER 19 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1989-110455 [15] WPIX
DNC C1989-048890
TI Silica based passivation or insulating films - obtd. by irradiating silica based films at reduced pressure.
DC E36 L03
PA (TOKQ) TOKYO OHKA KOGYO CO LTD
CYC 1
PI JP 01056315 A 19890303 (198915)* 5p
JP 08029932 B2 19960327 (199617) 5p
ADT JP 01056315 A JP 1987-212256 19870826; JP 08029932 B2 JP 1987-212256 19870826
FDT JP 08029932 B2 Previous Publ. JP 01056315
PRAI JP 1987-212256 19870826
AB JP 01056315 A UPAB: 19930923
UV light is irradiated on silica-based films under a reduced pressure.
USE/ADVANTAGE - Dense silica-based films free of pin holes and cracks are obtd., which have good mechanical resistance and are resistant to chemicals and humidity. They are used as passivation or insulating films for semiconductor devices, **orientation** film for **liquid crystal** displays, or as a surface protecting films for ceramics or **plastics**.
In an example, 'OCDType-6' (RTM: a silica-based coating liq. contg. hydrolysis prods. of alkoxysilane, Tokyo Ouka Kogyo) was spin-coated on a 4 inch silicon wafer at 3000 rpm for 20 sec. The coating was dried at 140 deg. C for 30 min.; the wafer was placed in a vacuum chamber of 'RVC-5002' (RTN: a UV-light treatment device, Tokyo Ouka Kogyo); the chamber was evacuated to 26.6 Pa; a UV-light with 253.7 nm and 20 mW/cm2 was irradiated on the silica coating for 5 min. while it was heated at 180 deg. C; then the silicon wafer was heated at 400 deg. C for 10 min. in N2 atoms. No **OH** gps. were detected and no pinholes and cracks were also found.

L21 ANSWER 20 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1988-119547 [17] WPIX
DNN N1988-090810 DNC C1988-053655
TI Tilted alignment method for liq. crystal - by treating substrate surface to provide desired tilted surface microstructure and free hydroxyl groups, using long chain alcohol.
DC L03 P81 U14 V07
IN LACKNER, M A; MARGERUM, D J; MILLER, J L; SMITH, H W; LACKNER, A M; MARGERUM, J D; MILLER, L J; SMITH, W H

PA (HUGA) HUGHES AIRCRAFT CO; (HOGA) HOEGANAESMETODER AB
CYC 20
PI WO 8802874 A 19880421 (198817)* EN 29p
RW: AT BE CH DE FR GB IT LU NL SE
W: AU DK JP KR NO
AU 8781579 A 19880506 (198830)
EP 285656 A 19881012 (198841) EN
R: BE CH DE FR
NO 8802596 A 19880905 (198841)
DK 8803159 A 19880610 (198848)
JP 01501574 W 19890601 (198928)
ES 2005032 A 19890216 (198938)
US 5011267 A 19910430 (199119)
IL 83900 A 19920818 (199244)
EP 285656 B1 19930303 (199309) EN 15p
R: BE CH DE FR GB IT LI NL SE
DE 3784487 G 19930408 (199315)
NO 174124 B 19931206 (199403)
CA 1328380 C 19940412 (199420)
DK 168646 B 19940509 (199422)
ADT WO 8802874 A WO 1987-US2341 19870915; EP 285656 A EP 1987-907170 19870915; JP 01501574 W JP 1987-506580 19870915; ES 2005032 A ES 1987-2903 19871013; US 5011267 A US 1986-919155 19861014; IL 83900 A IL 1987-83900 19870915; EP 285656 B1 EP 1987-907170 19870915, WO 1987-US2341 19870915; DE 3784487 G DE 1987-3784487 19870915, EP 1987-907170 19870915, WO 1987-US2341 19870915; NO 174124 B WO 1987-US2341 19870915, NO 1988-2596 19880613; CA 1328380 C CA 1987-546815 19870914; DK 168646 B WO 1987-US2341 19870915, DK 1988-3159 19880610
FDT EP 285656 B1 Based on WO 8802874; DE 3784487 G Based on EP 285656, Based on WO 8802874; NO 174124 B Previous Publ. NO 8802596; DK 168646 B Previous Publ. DK 8803159
PRAI US 1986-919155 19861014
AB WO 8802874 A UPAB: 19940203
Liq. crystal cell is prepared having a pair of opposed surfaces so that liq. crystals subsequently introduced into the cell will align with a uniform tilt in a tilted-**perpendicular alignment** between the surfaces in the absence of an applied field. The opposed cell surfaces are treated to provide generally aligned tilted surface microstructures with free hydroxyl gps.

A long chain alcohol is chemically reacted with microstructure, and long chain alkoxy groups produced are bonded to the fitted surface microstructures.

The tilted surface microstructures are obtained on the cell surfaces by deposition of two layers of SiOx on each surface at a medium grazing angle and a shallow grazing angle, respectively, where X is from 1 to 2.

The two layers are deposited at grazing angles which are shifted by approx. 90 deg. to each other. The alkoxy group derived from the long chain alcohol is bonded to the tilted surface microstructures by exposing the surfaces to alcohol vapours.

ADVANTAGE - Improved photostability.

Dwg.0/7

L21 ANSWER 21 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1985-192702 [32] WPIX
DNN N1985-144452 DNC C1985-083975
TI Smectic **liquid crystal** element - forms optical image from laser signals.
DC A85 E13 E14 L03 P81 U11 U14
PA (CANO) CANON KK

CYC 1
PI JP 60118786 A 19850626 (198532)* 7p
ADT JP 60118786 A JP 1983-226271 19831130
PRAI JP 1983-226271 19831130
AB JP 60118786 A UPAB: 19930925
Liq. **crystal** element comprises **liquid crystal** compsn. sealed in cell and contg. a cpd. of formula (I) (where R1 and R2 are each alkyl or may complete a cyclic amino gp.; and R3-R6 are each H, alkyl, alkoxy or **OH**, or R3 and R4 and/or R5 and R6 may be coupled together to form benzene ring(s)). The **liq** . **crystal** compsn. comprises smectic **liquid crystal** of positive dielectric anisotropy as disclosed in Published Jap. Patent Appln. Nos.56150030, 57040429 and 57051779 and opt. 0.5-15 wt.% of cholesteric **liq**. **crystal**. The cell comprises a pair of transparent electrodes of Sn oxide or In/Sn oxide or film of metallic AlCr, Ag or Ni attached to base plates (e.g. of glass or **plastic**) and opt. attached with **orientation** controlling plates (e.g. SiO, SiO2, Al2O3, polyvinyl alcohol, polyimide, polyamideimide, polyester imide, etc.) USE - The element forms an optical image corresponding to signals of laser beams.
1/2

L21 ANSWER 22 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1985-126678 [21] WPIX
DNN N1985-095145 DNC C1985-055241
TI **Plastic liquid crystal** display device - with alkyd melamine polymer as orienting film esp. filled with silica.
DC A89 L03 P81
PA (ASAG) ASAHI GLASS CO LTD
CYC 1
PI JP 60066232 A 19850416 (198521)* 6p
JP 03016006 B 19910304 (199113)
ADT JP 60066232 A JP 1983-174150 19830922; JP 03016006 B JP 1983-174150 19830922
PRAI JP 1983-174150 19830922
AB JP 60066232 A UPAB: 19930925
Plastic Lcd device is provided with patterned electrodes, a pair of substrates made of **plastic** treated to have lateral **orientation** effect confronting to each other, the periphery of the substrates is sealed and the inside filled with **liquid crystals**. The device is characterised by using alkyd melamine polymer as the material for the orienting film. The alkyd melamine polymer is alkyd melamine polymer filled with silica. The **orientation** film of alkyd melamine polymer is prepd. by coating a mixt. of methylol melamine having partly or completely etherified emthylol gps. (e.g. hexamethylol melamine hexamethyl ether) with polyhydric alcohol having at least 2 **OH** gps. (e.g. glycerin). Use of fine particulate silica is prefd. for the improvement of abrasion resistance of alkydmelamine polymer. Partic., use of fine particulate silica which is made hydrophobic is pref. for improvement of water resistance. Such hydrophobic silica is obtd. by reacting fine particulate silica having silanol gp. with alcohol. Useful **plastic** film is uniaxially stretched film of polyethylene etc. or amorphous film of polyether sulphone, etc..
USE/ADVANTAGE - After forming, if necessary, an organic or inorganic under coat layer on **plastic** film, forming ITO electrodes on there and patterning the electrodes, a compsn. for forming alkyd melamine polymer is coated on there. An **orientation** film having superior resistance to solvent, superior **orientation** effect on **liquid crystal**, and satisfactory transparency is obtd.

by heating the coated compsn. at 80-150 deg.C. for 15 min-1 hr.. Since no higher calcination process is necessary, **plastic** material can be adopted as the material for the **liquid crystal** display device.
0/1

L21 ANSWER 23 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1984-192176 [31] WPIX
DNN N1984-143551 DNC C1984-080893
TI Purificn. of **orientation** film of LCD element - by treating the film formed on substrate esp. **plastics**, with activated coal, silica gel or activated **alumina**.
DC A85 L03 P81
PA (HITA) HITACHI LTD
CYC 1
PI JP 59109027 A 19840623 (198431)* 3p
ADT JP 59109027 A JP 1982-218379 19821215
PRAI JP 1982-218379 19821215
AB JP 59109027 A UPAB: 19930925
Specifically a necessary electrode pattern is formed by forming transparent conductive electrode 11(ITO electrode) on an upper and lower substrates for polarising electrodes 9,10. After rubbing, a seal material (3) is laminated on (9,10) to form a package, then a **liquid crystal** material (4) is charged from a sealing port. Finally, a reflecting plate (7) is laminated on (10) thus, a display element is completed. The substrates (9,10) are of monoaxially drawn PET film and the **orientation** film is of polyetheramide resin. If a contaminating unstable material is contained in the material for the **liquid crystal** (4) electric current flowing between the upper and lower electrodes increases with time, and the rate of increase of such current is about twice that resulted by using purified **orientation** film.
For purificn. of the **orientation** film, 5 wt.% activated coal is first added to the **orientation** film, and stirred for 24 hr. at room temp., the product is filtered 20 wt.% activated **alumina**(neutral) is added, stirred for 2 hr. and filtered.
3/4

L21 ANSWER 24 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1983-708296 [28] WPIX
DNC C1983-065493
TI Lightweight **plastic** moulding - obtd. from resin compsn. obtd. by dispersing fine hollow spheres in aromatic polycondensate.
DC A23 A60
PA (TORA) TORAY IND INC
CYC 1
PI JP 58093759 A 19830603 (198328)* 4p
JP 01007626 B 19890209 (198910)
ADT JP 58093759 A JP 1981-191789 19811201
PRAI JP 1981-191789 19811201
AB JP 58093759 A UPAB: 19930925
Moulding is formed from a resin compsn. prepd. by dispersing 5-75 vol. % of fine hollow spheres in an aromatic polycondensate which shows optical anisotropy in molten state or in soln. (thermotropic or liotropic **liq. crystal** polymer). Pref. **liq. crystal** polymer is aromatic polyester e.g. fully aromatic polyester made from p-hydroxybenzoic acid and 6-**hydroxy** -2-naphthoic acid and aromatic polyester prepd. by reacting p-**hydroxy** aromatic carboxylic acid with polyethylene terephthalate,

poly(2,6-ethylene naphthalate), etc. Esp. fibre spun from the polymer under optimum conditions and having an initial **elastic** modulus of at least 200 g/c. is used. The hollow spheres includes **alumina**, silica, magnesia, glass, cellulose deriv., natural rubber latex, phenolic resin, PVAc, PVA, polystyrene, polyethylene, polyamide, PVC, epoxy resin, etc. with a small and uniform particle size.

The **plastic** moulding is lightweight and shows three dimensional **orientation** effect resulting in isotropically excellent mechanical properties.

L21 ANSWER 25 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1982-42743E [21] WPIX
TI Liq. crystal display element - including guest-host type colour liq. crystal display element contg. dichroic colouring material.
DC A85 L03 P81 P85 U11 U14
PA (HITA) HITACHI LTD
CYC 3
PI JP 57064209 A 19820419 (198221)* 12p
US 4472028 A 19840918 (198440)
KR 8902182 B 19890622 (199018)
ADT US 4472028 A US 1981-308615 19811005
PRAI JP 1980-139304 19801007
AB JP 57064209 A UPAB: 19930915
The element includes a guest-host type colour liq. crystal display element contg. dichroic colouring material. Two transparent base sheets held in parallel in a case, and a liq. crystal is charged between both sheets to form a display element. Each base sheet is coated with a polymer to form a coating over the surface facing the other sheet.

The polymer is selected from alkyl silanol polymers, alkyl silanol halide polymers and alkyl alkyl silanol halogenide polymers. The liq. crystal is e.g. nematic liq. crystal plus dichroic colouring material.

A liq. crystal display element is obtd. providing good photo-electric property and high brightness.

L21 ANSWER 26 OF 37 WPIX (C) 2002 THOMSON DERWENT
AN 1982-10251E [06] WPIX
TI Liq. crystal display operating in reflection mode - has rubbed and silanised reflector of aluminium flakes in insulating oxide on back electrode.
DC E11 L03 P81 U14
IN KAUFMANN, M; SCHAD, H
PA (BROV) BBC BROWN BOVERI & CIE AG
CYC 7
PI EP 45104 A 19820203 (198206)* DE 13p
R: CH DE FR GB LI
JP 57056818 A 19820405 (198219)
US 4492432 A 19850108 (198504)
EP 45104 B 19850410 (198515) DE
R: CH DE FR GB LI
DE 3169810 G 19850515 (198521)
ADT EP 45104 A EP 1981-200773 19810707; US 4492432 A US 1981-283175 19810714
PRAI CH 1980-5753 19800728
AB EP 45104 A UPAB: 19930915
Liquid crystal display (LCD) consists of a cell with 2 plane parallel plates (1,2) having electrode coats (3,4) on the inside, at least the front coat (3) being transparent, a nematic liquid crystal (I) with negative dielectric anisotropy, an intermediate reflector and a polariser. (I) is given **homeotropic** orientation by the rubbed orienting surfaces of the cell plates (1,2) and can be deformed by an electric

field. The intermediate reflector is applied to the back electrode layer (4), consists of an insulating oxide layer contg. Al flakes and is silanised after rubbing. Pref. (II) consists of Ce02, MgO, Si02, ItO, Zr02, **Al203**, or Gd203. The silane used for orientation is DMOAP (N,N-dimethyl-N-octadecyl -3-aminopropyl- trimethoxy- silyl chloride). The LC has a double refraction anisotropy of 0.04-0.15 and is "Lixon EN-18" (RTM). The distance between the plane parallel plates is max. 6 microns. The Al flakes are 2-10 microns long. A linear or circular polariser can be used.

The display has a great viewing angle range and much shorter switching times than those needed for transmission operation.
1

L21 ANSWER 27 OF 37 JAPIO COPYRIGHT 2002 JPO
AN 1999-029526 JAPIO
TI ACRYLIC ESTER COMPOUND AND USE THEREOF
IN OTSUJI ATSUO; SUZUKI RIHOKO; URAGAMI TATSUNOBU; TAKUMA HIROSUKE
PA MITSUI CHEM INC, JP (CO 000588)
PI JP 11029526 A 19990202 Heisei
AI JP1997-182449 (JP09182449 Heisei) 19970708
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 99, No. 2
AB PURPOSE: TO BE SOLVED:To obtain a new compound useful for providing a polymer, good in transparency, mechanical strength and heat resistance, having low birefringence properties and useful as an optical part such as a **plastic** substrate for optical disks, a pickup lens, a **plastic** substrate for **liquid crystal** cells or a prism.
CONSTITUTION: compound is represented by formula I (R1 is an alkyl, an alkenyl or an aralkyl; R2 is a (substituted)alkyl, a (substituted)alkoxy, nitro or a halogen; R3 and R4 are each H or methyl; (m) is 0-3; (n) is 0-20), e.g. a compound represented by formula IV. The compound represented by formula I is obtained by reacting, e.g. a **hydroxy** compound represented by formula II with acrylic acids represented by formula III or acid halides thereof.

L21 ANSWER 28 OF 37 JAPIO COPYRIGHT 2002 JPO
AN 1998-316453 JAPIO
TI LAMINATE AND WINDOW USING THE SAME
IN WATANABE HARUO
PA AFFINITY KK, JP (CO)
PI JP 10316453 A 19981202 Heisei
AI JP1997-137948 (JP09137948 Heisei) 19970514
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 98, No. 12
AB PURPOSE: TO BE SOLVED:To obtain a laminate having an image such as **vertical** division, stripe, checkered pattern, dot, letter or abstract pattern, by laminating and sealing an aqueous solution of a polymer or a hydrogel changing light transmission with rise in temperature together with a hydrophobic liquid or gel incompatible with water so as not change the whole face in the same manner but to partially provide perspective.
CONSTITUTION: ter-soluble polymer (e.g. **hydroxy** cellulose) which agglomerates with rise in temperature and shows cloudy light scattering may be cited, for example, as an aqueous solution of polymer or a hydrogel. A gel having a dimethylpolysiloxane skeleton such as a silicone oil may be cited as a hydrophobic liquid or gel. A laminate of a highly functional aqueous solution 2 and a hydrophobic liquid or gel 3 incompatible with water is laid between a pair of substrates. An isobutyl

sealant 4 is excellent in water vapor resistance and is stuck fast to a base 1. A base bonding resin 5 (e.g. epoxy-based resin adhesive) is required for fixing the sealant 4 to the base 1.

L21 ANSWER 29 OF 37 JAPIO COPYRIGHT 2002 JPO
AN 1994-202120 JAPIO
TI PRODUCTION OF **LIQUID CRYSTAL** DEVICE AND INFORMATION TRANSMISSION DEVICE USING THIS DEVICE
IN WADA TAKATSUGI; KODERA YASUHITO
PA CANON INC, JP (CO 000100)
PI JP 06202120 A 19940722 Heisei
AI JP1992-359307 (JP04359307 Heisei) 19921226
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: P, Sect. No. 1817, Vol. 18, No. 557, P. 65 (19941024)
AB PURPOSE: To produce the **liquid crystal** device having a large pretilt angle and to improve the reliability and quality of the device by executing a heat treatment in a vacuum or inert gaseous atmosphere, thereby preventing the deterioration in the **orientation** regulation power imparted to an **orientation** control film.
CONSTITUTION: Bead spacers 16 (silica beads, **alumina** beads, etc.) having about 1.5.mu.m average grain size are sprayed onto one glass substrate 11a (11b) of glass substrates 11a, 11b and a sealing adhesive 17 which is an adhesive of an epoxy resin is formed by a screen printing method on another glass substrate 11b (11a). Two sheets of these glass substrates 11a, 11b are held to face each other at 0.1 to 3.mu.m spacing and are subjected to a heat treatment to solidify the sealing adhesive 17. The heat treatment is executed in a vacuum or inert gaseous atmosphere in such a case. As a result, the **orientation** control film is less deteriorated than in the case of execution of the heat treatment in the atm. and the degradation in the pretilt angle is suppressed.

L21 ANSWER 30 OF 37 JAPIO COPYRIGHT 2002 JPO
AN 1991-122128 JAPIO
TI PRODUCTION OF MOLDED ARTICLE OF POLYMER
IN NOZAWA SEIICHI; ODA FUMIHIKO; SHIGA ISAMU
PA MITSUBISHI KASEI CORP, JP (CO 000596)
PI JP 03122128 A 19910524 Heisei
AI JP1989-258657 (JP01258657 Heisei) 19891005
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: C, Sect. No. 859, Vol. 15, No. 324, P. 37 (19910819)
AB PURPOSE: To obtain the title molded article having excellent **orientation** of magnetic field and high modulus of **elasticity** by impressing a magnetic field to a specific aromatic thermotropic **liquid crystal** polymer in a **liquid crystal** state.
CONSTITUTION: For example, a starting raw material of an aromatic thermotropic **liquid crystal** polymer (e.g. polyazomethine) is polymerized with a compound shown by formula I (X and Y are COOH, **OH**, etc.; Z is group shown by formula II (W1 and W2 are H, alkyl, etc.; 2.ltoreq.n.ltoreq.6) or group shown by formula III (W3 to W5 are as shown for W1)) as a spacer in order to provide .gtoreq.30 mol% structure having a main chain which mutually bonds aromatic rings to form the polymer and comprises 2-8 atoms and containing one or more C-C bonds in the main chain to give a spacer-containing aromatic thermotropic **liquid crystal** polymer. Then the polymer is melted and, in a state of fluidity, a magnetic field having .gtoreq.10,000 gauss is impressed to the polymer for 5-90 minutes and injection molded to give the objective molded article.

L21 ANSWER 31 OF 37 JAPIO COPYRIGHT 2002 JPO
AN 1988-066537 JAPIO
TI FERROELECTRIC **LIQUID CRYSTAL** PANEL
IN KAMIMURA TSUYOSHI; OOBA SHIYUUKO; WAKITA HISAHIDE; ONISHI HIROYUKI; OOTA ISAO
PA MATSUSHITA ELECTRIC IND CO LTD, JP (CO 000582)
PI JP 63066537 A 19880325 Showa
AI JP1986-212226 (JP61212226 Showa) 19860909
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: P, Sect. No. 742, Vol. 12, No. 29, P. 70 (19880809)
AB PURPOSE: To improve a memory effect of a **liquid crystal** panel by depositing **aluminum oxide** by evaporation on a substrate from the direction diagonal thereto and executing **orientation** control of a ferroelectric **liquid crystal**.
CONSTITUTION: Al2O3 is deposited by evaporation from the diagonal direction onto the substrate 92 on which a transparent electrode layer is provided. For example, the substrate 92 is set with inclination by an angle (e.g.: 85.degree.) with the vapor deposition direction from the perpendicular direction to the substrate in a bell-jar 91. Al2O3 is used for a vapor deposition source 93 and is heated by projecting an electron beam, etc. Fine projection groups of Al2O3 are thereby formed in a specified direction on the electrode layer of the substrate 92. The vapor deposition directions of the Al2O3 on the upper and lower substrates are anti-paralleled with each other to constitute the cell and the ferroelectric **liquid crystal** is sealed into the cell.
The thickness thereof is preferably adjusted to .ltoreq.5.mu.m. The **liquid crystal** molecules are thereby oriented to the structure to cause the smallest **elastic** deformation and the **liquid crystal** panel having a high memory effect is obtd.

L21 ANSWER 32 OF 37 JAPIO COPYRIGHT 2002 JPO
AN 1987-170939 JAPIO
TI **LIQUID CRYSTAL** ELEMENT
IN SEKIMURA NOBUYUKI; YOSHIDA AKIO; KURIBAYASHI MASAKI
PA CANON INC, JP (CO 000100)
PI JP 62170939 A 19870728 Showa
AI JP1986-12338 (JP61012338 Showa) 19860122
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: P, Sect. No. 655, Vol. 12, No. 12, P. 110 (19880114)
AB PURPOSE: To prevent the increase of the reversed electric field by imposing granular bodies between one pair of substrates provided with protective layers which prevent direct contact of between the color filter layers and the color filter layer and a ferroelectric **liquid crystal** (FLC) respectively.
CONSTITUTION: The color filter 31 comprises one of the color image units composed of blue colored layer 31B, the green colored layer 31G and the red colored layer 31R. The protective layer 32 which prevents the direct contact of the color filter layer 31 and the FLC 35 has the insulating and the **orientation** controlling properties, and is made of an org. insulating substance such as a cellulose resin, a melamine resin, an urea resin, an acrylic resin and a photoresist resin, etc. The granular bodies 39 control the gap of between the pair of the substrates 33a and 33b, and is composed of glass beads, **alumina** beads and **plastic** beads. The FLC 35 is composed of the chiral smectic **liquid crystal** and has a non-spiral structure. Thus, the increase of the reversed electric field due to depressing a resistance of the FLC is

reduced.

L21 ANSWER 33 OF 37 JAPIO COPYRIGHT 2002 JPO
AN 1987-141519 JAPIO
TI SEALING AGENT FOR **PLASTIC** FILM **LIQUID CRYSTAL** ELEMENT
IN KAMOI SUMIO; MATSUKI YUMI
PA RICOH CO LTD, JP (CO 000674)
PI JP 62141519 A 19870625 Showa
AI JP1985-282496 (JP60282496 Showa) 19851216
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: P, Sect. No. 642, Vol. 11, No. 37, P. 96 (19871203)
AB PURPOSE: To obtain the titled sealing agent having an excellent sticking strength against a substrate made of a **plastic** film and having a **liquid crystal** resisting property and an anti-**orientation** property by incorporating a cured reaction product obtd. from a specific epoxy resin and a specific liquid acrylonitrile-butadiene copolymer derivaties to the titled agent.
CONSTITUTION: The titled sealing agent comprises the cured reaction product obtd. by reacting the epoxy resin having two or more of epoxy groups in a molecule, and the liquid acrylonitrile-butadiene copolymer derivatives having the acrylonitrile and butadiene units as the main chain of the copolymer and the active groups capable of reacting with the epoxy group at the both ends of said copolymer. The copolymer has preferably 3,000-4,000mol.wt. The representative copolymer is shown by formula I wherein R is a carboxylic group, a primary, a secondary or a tertiary amine residue, a phenyl, a **hydroxy**, or an acid anhydride residue, (x) is 1-10, (y) is 1-5 and (z) is 5-15.

L21 ANSWER 34 OF 37 JAPIO COPYRIGHT 2002 JPO
AN 1984-184324 JAPIO
TI **LIQUID CRYSTAL** DISPLAY ELEMENT
IN AKIYAMA NOBUYUKI; HATSUTORI MOTOZOU; SAWADA KAZUTOSHI
PA ASAHI GLASS CO LTD, JP (CO 000004)
PI JP 59184324 A 19841019 Showa
AI JP1983-58636 (JP58058636 Showa) 19830405
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: P, Sect. No. 337, Vol. 9, No. 441, P. 100 (19850223)
AB PURPOSE: To obtain a **liquid crystal** display element which is low in adhering temp., has adhesive power, is stable to contact with a **liquid crystal** and has excellent productivity and durability by using a specific urethane adhesive agent as a sealant.
CONSTITUTION: A transparent electrode such as In2O3-SnO2 or the like is formed on the surface of a **plastic** film and if necessary an overcoating layer of a resin is further formed thereon. The film is then subjected to an orienting treatment such as rubbing or treatment with a **vertical** orienting material, thereby forming a substrate. The electrode of the rear side substrate is formed as a reflective electrode. An undercoating layer of SiO2, resin, etc. is formed between the **plastic** film and the electrode. The substrates formed in such a way are mated in such a way that the electrode surfaces face each other, then the periphery is sealed with a sealant. An urethane adhesive agent which brings a polyol compd. and an aliphat. isocyanate into reaction is used as the sealant. The sealant is mixed with a spacer material such as glass fibers, **alumina** particles or the like in order to regulate the cell spacing and is printed on the sealing part of the substrates by screen printing, etc.

L21 ANSWER 35 OF 37 JAPIO COPYRIGHT 2002 JPO

AN 1984-109027 JAPIO
TI METHOD FOR PURIFYING ORIENTING FILM OF **LIQUID CRYSTAL** DISPLAY ELEMENT
IN ITSUKIDA NOBORU; MATSUYAMA SHIGERU; SASAKI MASARU
PA HITACHI LTD, JP (CO 000510)
PI JP 59109027 A 19840623 Showa
AI JP1982-218379 (JP57218379 Showa) 19821215
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: P, Sect. No. 308, Vol. 8, No. 2281, P. 138 (19841019)
AB PURPOSE: To improve the reliability of a liq. crystal display element having **plastic** substrates by treating cold curing orienting films with an adsorbent made of an ionic substance to remove contaminants contained in the films.
CONSTITUTION: Transparent electrodes 11 and orienting films of polyether amide resin or the like are formed on the surfaces of upper and under polarizing electrode substrates 9, 10 each having a polarizing film on a **plastic** film such as a polyethylene terephthalate film, and known **orientation** treatment is carried out. The substrates 9, 10 are placed opposite to each other with a sealant 3 in- between, and a liq. crystal material 4 is injected into the formed space to obtain a liq. crystal display element. In the figure, a symbol 7 is a reflecting plate. When the elemet is manufactured by said method, the orienting films are treated with an adsorbent made of an ionic substance such as activated carbons, silica gel or activated **alumina**, and the treated films are used to assemble the element. A liq. crystal display element having stability for a long term is obtd. Electric current flowing between the electrodes of the element is increased at a very low rate with the lapse of time.

L21 ANSWER 36 OF 37 JAPIO COPYRIGHT 2002 JPO
AN 1984-045427 JAPIO
TI FORMATION OF **LIQUID CRYSTAL** ORIENTING FILM
IN NARITA KENICHI; TANAKA TOSHIHIKO
PA SANYO ELECTRIC CO LTD, JP (CO 000188)
TOTTORI SANYO ELECTRIC CO LTD, JP (CO 323436)
PI JP 59045427 A 19840314 Showa
AI JP1982-156219 (JP57156219 Showa) 19820907
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: P, Sect. No. 285, Vol. 8, No. 1471, P. 33 (19840710)
AB PURPOSE: To obtain a **liquid crystal** orienting film which eliminates uneven **orientation** and has good moisture resistance in the formation of the **liquid crystal** orienting film for a nematic type **liquid crystal** display device, by using an aq. soln. of a specific org. titanium compd. and PVA and forming the film on the substrate by a dipping method.
CONSTITUTION: Orienting films 4 are provided on the surfaces of two sheets of substrates 2 having electrodes 1 of desired shapes in contact with a nematic **liquid crystal** in order to maintain **liquid crystal** molecules 3 in parallel with the substrates 2 in a **liquid crystal** device wherein said substrates 2 are supported in parallel at 5-20.mu.m spacing and the **liquid crystal** is sandwiched between the same. The orienting films are formed by adding Ti(OR)4 (OR is either of a **hydroxy** group and an alkoxy group) in an aq. PVA soln. at 0.5.ltoreq.Ti(OR)4.ltoreq.2 ratio to prepare a coating liquid. The substrates 2 are dipped in the coating liquid kept at 40-80.degree.C and are pulled up to form the films 4. The films are then kept at 140-250.degree.C and are thus cross-linked by heating. Then the **liquid crystal** orienting films which eliminate uneven

orientation and have excellent heat resistance are formed with good productivity.

L21 ANSWER 37 OF 37 JAPIO COPYRIGHT 2002 JPO
AN 1979-161959 JAPIO
TI **LIQUID CRYSTAL** DISPLAY DEVICE
IN NAKAMURA MINORU; OGOSHI TOKIO
PA HITACHI LTD, JP (CO 000510)
PI JP 54161959 A 19791222 Showa
AI JP1978-70371 (JP53070371 Showa) 19780613
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: E, Sect. No. 173, Vol. 4, No. 241, P. 50 (19800229)
AB PURPOSE: To so form the device that the film after coating is smooth and superior in adhesion and withstands high temperature heat treatment like glass sealing by constituting an **orientation** control layer by the silanol condensate containing a suitable amount of **OH** in its molecular structure.
CONSTITUTION: Ethyl silicate which forms **OH** through hydrolysis condensation is dissolved at a concentration of less than 30wt% in a suitable solvent containing water and is allowed to react for about 30 minutes 30 to 3 hours at 20 to 70.degree.C. This coating solution for forming **orientation** control layer is coated on a substrate with electrodes so as to become about 100 to 3000.ANG. thick and is then heat-treated at temperatures of about 200 to 550.degree.C after drying for about 30 minutes at about 150.degree.C, whereby the **orientation** control layer composed of the silanol condensate containing 3 to 20wt% of **OH** is formed. Next, the surface thereof is rubbed in a fixed direction by a suitable cloth, after which a pair of the substrates are opposedly disposed by way of a spacer and **liquid crystal** is sealed therein.

FILE REGISTRY
L1 299 S (AL AND O)/ELS AND 2/ELC.SUB
L2 1 S ALUMINUM OXIDE/CN

FILE HCAPLUS
L3 197463 S (L1 OR L2)

L4 2485 S AL203 OR AL205 OR AL2O2 OR AL2O
L5 723 S (L4 OR L3) AND ((ALIGN? OR ORIENTAT?)(5A)(L
AYER? OR FILM OR COAT####))
E PLASTIC/CT
E PLASTICS/CT
E E3+ALL/CT
L6 25 S ("MULLINS SOFTENING EFFECT"/CT OR RESINIFIC
ATION/CT OR ORGANOSOLS/CT OR PLASTISOLS/CT OR
PLASTOMERS/CT OR
"SYNTHETIC RESINS"/CT)
L7 30 S L5 AND (PLASTIC? OR THERMOPLASTIC? OR L6
OR THERMOSET? OR (RESINOUS? OR POLYMER? OR
SYNTHETIC?)(2A)(MATE
RIAL? OR SUBSTANCE? OR MOLD? OR CAST?))
AB 1-30
L8 335923 S AL(W)OXIDE OR ALUMINUM(W)OXIDE OR ALUMINIUM
(W)OXIDE OR AL(2A)O OR AL2O3 OR AL2O5 OR AL2O2 OR AL2O
L9 335909 S L8 NOT L7
L10 548 S L9 AND ((ALIGN? OR ORIENTAT?)(5A)(LAYER?
OR FILM OR COAT####))
AB 1-3
L11 3 S L10 AND (PLASTIC? OR THERMOPLASTIC? OR L6
OR THERMOSET? OR (RESINOUS? OR POLYMER? OR
SYNTHETIC?)(2A)(MATE
RIAL? OR SUBSTANCE? OR MOLD? OR CAST?))

L12 48 S L10 AND (HOMEOTROPIC OR VERTICAL? OR
PERPENDICULAR)
L13 62 S L5 AND (HOMEOTROPIC OR VERTICAL? OR
PERPENDICULAR)
L14 80 S L13 OR L12
L15 80 S L14 NOT L7

L16 64 S L15 AND SUBSTRATE

L7 ANSWER 1 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:417620 HCAPLUS
DN 137:7151
TI Scratch-resistant cured products of polyfunctional (meth)acrylate compositions and structures using the cured products
IN Nishikawa, Akira; Shimomura, Hiroomi
PA Jsr Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002160330	A2	20020604	JP 2000-354972	20001121

AB The cured products showing t2/t1 [(max. film thickness)/(min. film thickness)] ratios of 1.3-3 are prepd. from curable resin compns. contg. polyfunctional (meth)acrylates, inorg. oxide particles (no.-av. particle size 5-500 nm), and curing agents. The cured products are useful as parts of antireflective film laminates, antisoiling **films**, water-repellent **films**, antistatic **films**, **alignment films**, primer **layers**, color filters, fluorescent films, polarizing films, or photoconductive films. Thus, A 4300 (polyester film) was coated with a curable resin compn. contg. a reactive alkoxysilane (prepd. from mercaptopropyltrimethoxysilane, isophorone diisocyanate, and pentaerythritol triacrylate), MEK-ST (silica sol dispersed in MEK), NK Ester A-TMPT (trimethylolpropane triacrylate), NK Ester A-TMPT 3EO (trimethylolpropane triethoxylate triacrylate), and Irgacure 184 to form a 22-.mu.m film, coated with a compn. contg. NK Ester A-TMPT, NK Ester A-TMPT 3EO, Irgacure 184, and MP 1040 (silica sol) to form a film (t2/t1 1.6), and coated with Opstar JN 7215 (top coating) to give a scratch-resistant multilayer film.

L7 ANSWER 2 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:350691 HCAPLUS
DN 136:326323
TI Friction devices
IN Kasatkin, G. P.; Levit, M. Z.; Kraynova, N. A.; Golkin, V. B.; Piven, E. G.; Izyumova, V. I.
PA Otkrytoe Aktsionernoe Obshchestvo Nauchno-Issled I Konstruktorsko-Tekhnologicheskii Inst Asbestovykh Tekhnicheskikh Izdelii - Firma Ti, Russia
SO Russ., No pp. given
CODEN: RUXXE7
DT Patent
LA Russian
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RU 2155282	C1	20000827	RU 1999-104061	19990226

AB Asbestos-free friction devices, e.g. disk or drum brake pads, comprise polymer binder, e.g., PhOH-HCHO resin or butadiene rubber, fibrous reinforcing fillers, e.g., glass fibers, dispersed fillers, e.g. bronze powder, graphite, alumina, etc., and intermediate damping layer located between the binder and fibrous reinforcing fillers, e.g., nitrile rubber latex. Fibrous reinforcing filler(s) are subjected to preliminary local destructive action aimed at forming deformation and defects in the structure of damping layer where the destructive action took place. Such

friction devices have enhanced **alignment** and **plasticity** of surface **layer** at friction surface during contact in the course of operation which results in reducing local specific pressures and surface temps.

L7 ANSWER 3 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:208571 HCAPLUS
DN 136:329220
TI Development of superplastic Al2O3/Y-TZP duplex laminates
AU Sullivan, Todd; Wang, Jue; Kovar, Desiderio; Taleff, Eric M.
CS Materials Science and Engineering Program and Department of Mechanical Engineering, University of Texas at Austin, Austin, TX, 78712, USA
SO Ceramic Transactions (2001), 128(Advances in Ceramic Matrix Composites VII), 89-100
CODEN: CETREW; ISSN: 1042-1122
PB American Ceramic Society
DT Journal
LA English
AB Duplex laminate composite structures composed of high-purity Al2O3 and 3Y-TZP (3 mol % yttria-partially stabilized, tetragonal zirconia polycrystals) were processed by tape casting. Duplex particulate composites of various compns. and laminate composites of these were manufd. Fine grain sizes and high densities were achieved and proved to be favorable for superplasticity. Strain-rate-change tests were conducted to evaluate the dependence of flow stress in the laminate and particulate composites on strain rate. The data show that **orientation** of the **layers** relative to the applied stress has only a small effect on the deformation behavior. Low flow stresses were obsd. for some of the composites and the low flow stresses are expected to be conducive to large elongation-to-failure.
RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 4 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:152126 HCAPLUS
DN 136:266205
TI Chromium-replacing coatings obtained by physical vapor deposition - Nochrome
AU Arezzo, F.; Lewus, M. O.
CS CSM, Rome, I-00128, Italy
SO European Commission, [Report] EUR (2001), EUR 20040, 1-115
CODEN: CECED9; ISSN: 1018-5593
DT Report
LA English
AB The objective of this research program was to evaluate phys. vapor deposited (PVD) coatings - mostly chosen from the transition metals - as replacements for conventional chromium based passivation or conversion coatings, used on hot dip galvanized (HDG) and electrozinc (EZ) coated mild steel strip. Prior to the PVD coating work, a preliminary structural and compositional characterization of both nonchromated and chromated HDG and EZ materials was carried out using optical and SEM, 3D Form Talysurf and AFM imaging techniques, sputtered neutral mass spectrometry (SNMS), secondary ion mass spectrometry (SIMS), and x-ray diffraction (x-ray diffraction) techniques. The presence of aluminum and zinc at the surface/near surface of nonpassivated, extra smooth HDG is indicative of a mixed oxide surface layer and arises as a direct consequence of aluminum and zinc oxide formation at the zinc surface following the final stages of solidification. Aluminum enrichment at the surface of the extra smooth HDG coating is significantly greater than that for the normal spangle HDG

and is thought to reflect differences in process conditions (cooling rate). X-ray diffraction revealed [002] preferred orientation in both extra smooth HDG and EZ coatings. In addn., evidence for iron-zinc intermetallic phases were found in the extra smooth HDG coating. Conventional x-ray diffraction spectra have shown the presence of a CuZn5 phase in this coating, however, most of the zinc and copper were present in metallic form. The bulk of the 100 nm copper coating is in the form of copper metal with the coating surface showing relatively high levels of carbon, silicon and oxygen, arising from contamination and oxidn. The SNMS compn. depth profiles through the 100 nm thick titanium coatings deposited at Hull University exhibited a higher residual oxygen concn. compared to the copper coatings and this reflects the greater affinity of titanium for oxygen. However, Ti, Al, and Mn did exhibit a lower propensity to white rusting than non chromated HDG material. It was further demonstrated that the 50 nm or 100 nm thick Ti or Al coatings were more effective at reducing white rust on HDG than the 10 nm thick coatings. Cyclic salt spray corrosion test data revealed that the presence of a PVD titanium or copper coating significantly influenced the progression of white and red rusting. The presence of fine scale defects which allow ingress of corrosive agents may also be a contributory factor for impairing coating performance. Based on a preliminary ranking, derived by the performance in std. humidity, cyclic salt spray and, to a lesser extent, electrochem. corrosion tests, aluminum and titanium coatings were found to offer the most potential as replacements for the conventional chromate system. Aluminum titanium and manganese coatings were deposited on steel strip samples for this purpose by PVD immediately after they had been coated with zinc, using the same PVD chamber. The coatings obtained in this second phase were tested for corrosion resistance, utilizing various techniques such as salt spray, linear polarization resistance (LPR) and electrochem. impedance spectroscopy (EIS). The main purpose of the testing was that of establishing the potential of each coating type to function as a passive layer. The most important result was that PVD coatings were found to perform much better than non chromated ref. materials and even better than chromated ref. materials in some cases. In particular, aluminum PVD coatings showed the best corrosion resistance properties and, in fact they were comparable to the well known com. Aludip. Once a satisfactory adhesion could be obtained for all the PVD coatings, painted with the full PVC-Plastisol system, it was necessary to assess their corrosion resistance properties. In this regard, while the thicker (1-1.5 .mu.m) PVD Al and Ti coatings, in the painted condition, did not show a satisfactory performance, the thinner (50-500 nm) ones gave results comparable to or better than the conventional chromated materials. The Mn PVD coatings, in particular, which had shown a good performance in the unpainted condition, behaved poorly once painted. The exptl. results have clearly demonstrated that PVD Al and Ti coatings can be deposited on zinc coated steel strip, improving drastically corrosion resistance up to a level comparable and, in some cases, better than that offered by conventional chromated HDG and EZ materials. In particular, thin (50-500 nm) coatings can be utilized as conversion layers. In fact, they not only give good corrosion resistance to the zinc underlayer, but can also offer a good adhesion to primer/paint system overlayers. On the other hand, thick (1-2 .mu.m) coatings represent good alternatives to Cr passivation layers, in unpainted applications.

RE.CNT 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 5 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:106985 HCAPLUS

DN 136:131209
TI Microtiterplate with filter insert for microscopic detection of the reaction products
IN Poschen, Lothar; Wilhelm, Ralf
PA Forschungszentrum Juelich G.m.b.H., Germany
SO Ger. Offen., 10 pp.
CODEN: GWXXBX
DT Patent
LA German
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 10035750	A1	20020207	DE 2000-10035750	20000722
	GB 2365126	A1	20020213	GB 2001-17297	20010716
	NL 1018571	C2	20020129	NL 2001-1018571	20010718
PRAI	DE 2000-10035750	A	20000722		

AB The invention concerns a microtiterplate composed of multiple layers including a filter; the filter is removed after the hybridization or immunoassay is performed for the detection of the assay products. The bottom part is a plate with wells that is supported by an attached plate; the wells are supplied and emptied via the support plate using a pump system;the filter or filter stripes cover the bottom of the wells. The cover plate contains **aligning** holes; the **layers** are sealed reversibly; after the assay is completed, the filter is removed and transfered to the microscope. The microtiterplate is steel coated with teflon, glass, **plastics** or ceramics. The filter material is polycarbonate, alumina, or cellulose nitrate.
RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 6 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:87172 HCAPLUS
DN 136:119609
TI Multilayered, transparent, biaxially oriented polyester film
IN Pfeiffer, Herbert; Hilkert, Gottfried
PA Mitsubishi Polyester Film G.m.b.H., Germany
SO Eur. Pat. Appl., 15 pp.
CODEN: EPXXDW
DT Patent
LA German
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1176005	A2	20020130	EP 2001-116685	20010717
	EP 1176005	A3	20020320		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	DE 10036407	A1	20020207	DE 2000-10036407	20000726
	US 2002045039	A1	20020418	US 2001-892175	20010626
	US 6420019	B1	20020716		
	JP 2002103549	A2	20020409	JP 2001-225135	20010725
PRAI	DE 2000-10036407	A	20000726		

AB Title films, useful for lids for yogurt containers, have a base layer contg. .gtoreq.80% **thermoplastic** polyester, and top layer contg. particles, such that the gloss of the surface is >170, the haze is <2.4%, the planar **orientation** of the **film** is <0.162, and the abrasion coeff. is <0.6. These films are manufd. by biaxially stretching the extruded, filled films in combinations of the conditions: increasing the machine direction (MD) stretching temp. from 3 to 15K, decreasing the

MD stretching ratio from 0.3 to 0.8, increasing the transverse direction (TD) stretching temp. from 4 to 15K, and decreasing the TD stretching ratio from 0.3 to 0.8.

L7 ANSWER 7 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:891623 HCAPLUS
DN 136:38483
TI Biaxially oriented transparent gas-barrier polyester films deposited with oxides
IN Matsunaga, Atsushi; Hiraoka, Toshihiko; Miyagawa, Masamichi
PA Toray Industries, Inc., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001342267	A2	20011211	JP 2000-166925	20000605

AB Title **films** had **orientation** coeff. 0.160-0.180, refractive index on the transverse direction 1.495-1.505, Young's modulus in the longitudinal direction at 150.degree. .gtoreq.200 MPa, melting peak 215-240.degree., terminal CO2H 25-60 equivalence/t.

L7 ANSWER 8 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:754099 HCAPLUS
DN 135:274066
TI Particle-containing polyester compositions and their films with excellent thermal stability and mechanical properties
IN Tsukuki, Toshihiro; Kojima, Hiroshi; Yoshida, Minoru
PA Toray Industries, Inc., Japan
SO Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001288347	A2	20011016	JP 2000-104471	20000406

AB The compns., useful for magnetic tapes, ink ribbons, and recording materials, contain polyesters prepd. from dicarboxylic acids (or their derivs.) and diols (or their derivs.) and 25-90% particles and show the content of carboxy terminal groups 10-100 equiv/ton and the content of diol components .ltoreq.5%. Thus, a 100:70 di-Me terephthalate-ethylene glycol mixt. was transesterified, mixed with 50% (based on 100% the resulting polymer) a 62.1:22.8:6.2:2.1:1.2 SiO2-Al2O3-Fe2O3-CaO-MgO mixt. (av. particle size 12.5 .mu.m, bulk d. 1.2 g/cm3), polycondensed, and molded into a biaxially oriented film with good fire resistance and flexibility.

L7 ANSWER 9 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:717240 HCAPLUS
DN 135:266068
TI Biaxially oriented laminated polyester film for base film of video tape
IN Doi, Eiji; Tanaka, Kazunori; Ikeda, Yoshifumi
PA Toray Industries, Inc., Japan
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent

LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001270056	A2	20011002	JP 2000-88095	20000328

AB The .gtoreq.2-layer laminated polyester film has a layer with protrusion d. of .gtoreq.0.4-.mu.m, .gtoreq.0.2-.mu.m, and 0.01-0.1-.mu.m height 10-200, 300-1000, and 12,000-30,000 counts/mm2, resp. The film shows good scratch resistance and high-peed winding property.

L7 ANSWER 10 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:587011 HCAPLUS
DN 135:160108
TI Photocatalyst material containing TiO2 crystal **coating** highly **aligned** to (112) direction
IN Saito, Hidetoshi; Tanaka, Norio
PA Kosei K. K., Japan
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001219072	A2	20010814	JP 2000-32344	20000209

AB The title photocatalyst material comprises a substrate (selected from metal, glass, ceramics, and **plastics**) and a (112)-oriented TiO2 crystal coating layer (having a thickness of .gtoreq.0.1 .mu.m and a crystal size of 0.01-10 .mu.m). The photocatalyst material shows excellent photocatalytic properties like antibacetrial, self-cleaning, super-hydrophilic properties.

L7 ANSWER 11 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:159447 HCAPLUS
DN 134:179716
TI Oriented organic polymer films, method and apparatus therefor, easily tearable films and materials therefrom
IN Kagawa, Seiji
PA Japan
SO Jpn. Kokai Tokkyo Koho, 20 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001059031	A2	20010306	JP 1999-324179	19991115
PRAI	JP 1999-166840	A	19990614		

AB Title films, having mol. oriented in the thickness direction, are prepd. by continuously applying high-elec. voltage on the org. resin films and contacting with d.c.-applied elec. conductive components from app. consisting of rolls having angular dielec. particles on the surfaces, rotating devices, pressurizing devices, and d.c.-supplying devices or consisting of blocks having angular hard particles on surface layers, conveying devices, high-frequency-elec. power-supplying devices, and d.c.-supplying devices. The above dielec. particles are selected from diamond, Al2O3, SiC, ZrO2, and SiO2 particles and the resin films are selected from polypropyleen, PET and nylon films. The hot-melt resin films, Al, paper, and nonwoven cloths are used along with the oriented

resin films to form easily terable materials.

L7 ANSWER 12 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:856043 HCAPLUS
DN 134:135305
TI Mechanical properties of TiN **films** with the preferred **orientations** by nano-indentation method
AU Matsumuro, A.; Watanabe, T.; Hayashi, T.; Mori, T.; Takahashi, Y.
CS Department of Micro System Engineering, Nagoya University, Nagoya, 464-8603, Japan
SO Microstructures and Mechanical Properties of New Engineering Materials, International Symposium on Microstructures and Mechanical Properties of New Engineering Materials, 4th, Beijing, China, Sept. 20-23, 1999 (1999), 155-160. Editor(s): Xu, Bingye; Tokuda, Masatake; Wang, Xiaochun. Publisher: International Academic Publishers, Beijing, Peop. Rep. China. CODEN: 69ARMW
DT Conference
LA English
AB TiN films with the (111) and (200) preferred orientations were formed on Si(100) and sapphire(0001) substrates by ion-beam-assisted deposition. The difference in the mech. properties between the (111) and (200) preferred **orientation** TiN thin **films** was clarified by the nano-indentation technique with the trigonal diamond tip. Their expts. revealed significant differences in hardness H and modulus E* irresp. of substrate materials; i.e., H=16 GPa, E=316 GPa for the (200) preferred orientation and H=9 GPa, E=192 GPa for the (111) preferred orientation. The behavior of the **plastic** deformation in TiN films was estd. by the cross-sectional SEM observation and the TEM anal. These microstructural analyses showed the evidence of the **plastic** deformation in a NaCl-type TiN crystal and significant difference of cross-sectional views of the **plastic** deformation.
RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 13 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:842071 HCAPLUS
DN 134:5761
TI Biaxially **orientated** multi **layer** polyester **film** for magnetic recording medium
IN Kobayashi, Ieyasu; Osawa, Toshifumi
PA Teijin Limited, Japan
SO PCT Int. Appl., 37 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000071339	A1	20001130	WO 2000-JP3188	20000518
	W: JP, KR, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	EP 1190848	A1	20020327	EP 2000-929784	20000518
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
PRAI	JP 1999-145026	A	19990525		
	WO 2000-JP3188	W	20000518		

AB A biaxially **orientated** multi **layer** polyester **film** comprises a polyester B layer and, laminated thereon, a

polyester A layer, wherein (1) the polyester A layer contains three types of fine particles each of which has an av. particle diam. different from those of the others, and has a surface roughness WRa of 5-20 nm and a surface roughness WRz of 100-300 nm, (2) the polyester B layer has a surface roughness WRa of 2-10 nm and a surface roughness WRz of 30-150 nm, and (3) the film has a friction coeff. of 0.5 or less. The film is excellent in winderability and handling characteristics, and also, when used as a base film of a high d. magnetic recording medium, esp. a digital recording type magnetic recording medium, can impart excellent characteristics of electromagnetic signal conversion to the medium.

RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 14 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:705388 HCAPLUS
DN 133:303551
TI Biaxial-oriented polyester film for photoresist film
IN Mizutani, Kei; Murooka, Hirofumi; Hasegawa, Kinji
PA Teijin Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000275860	A2	20001006	JP 1999-37126	19990216
PRAI	JP 1999-12983	A	19990121		

AB The title polyester film is made from a polyester compn. contg. .gtoreq.2 kinds of inert particles of different diams. and has 1.0-30.0 .mu.m thickness. The inert particles, one kind of which is coagulated particles formed from the primary particles, contain .gtoreq.1 elements selected from Al, Si, Ca, and Mg. The film has the surface roughness of 10-80 nm SRa and 700-1500 nm SRz, 20-120 mmHg/h air-passing rate between the films, and 0-500 .mu.m slippage of the side edge of a half inch-width film at 250 m/min taking up speed. The film shows the excellent transparency, slip, and taking up characteristics.

L7 ANSWER 15 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:674918 HCAPLUS
DN 133:255563
TI Effects of the crystal orientation relationship at the interface of Cu/Al2O3 joints on fracture energy
AU Liu, Weiping; Elaaner, G.; Ruhle, M.
CS Department of Materials Science and Engineering, Dalian Railway Institute, Dalian, 113028, Peop. Rep. China
SO Jinshu Xuebao (2000), 36(8), 879-882
CODEN: CHSPA4; ISSN: 0412-1961
PB Kexue Chubanshe
DT Journal
LA Chinese
AB Single cryst. Cu and .alpha.-Al2O3 (sapphire) with different crystallog. orientation relationships at the interface were diffusion-welded in vacuum with and without a thin film Nb interlayer. Effects of the orientation relationship at the interface on the fracture energy of Cu/Al2O3 and Cu/Nb/Al2O3 diffusion-bonded joints were studied. Results show that the orientation relationship between Cu and .alpha.-Al2O3 single-crystals at the interface remarkably influences the fracture energy of the metal/ceramic joint by changing both the work of adhesion of the

metal-ceramic interface and the dissipated energy caused by **plastic** deformation of the metal side of the joint. The Cu/Al2O3 joints with the orientation relationship (100)[011]Cu // (0001)[11.hivin.20]Al2O3 have the lowest fracture energy values, while the Cu/Nb/Al2O3 joints with the same orientation relationship between Cu and Al2O3 are the toughest among the tested joints.

L7 ANSWER 16 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:606738 HCAPLUS
DN 133:186516
TI Templates for seeding growth of single crystal on arrayed nucleation sites defined on nucleation unfriendly substrates
IN Saxena, Arjun N.
PA USA
SO U.S., 31 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6110278	A	20000829	US 1998-131764	19980810
	US 6392253	B1	20020521	US 1999-370100	19990806
PRAI	US 1998-95990P	P	19980810		
	US 1998-131764	A	19980810		

AB A template for seeding growth of a desired single-crystal material (e.g., Si, GaAs) is created by passing through a monocryst. channelizing mask, in a channelizing direction thereof, at least one of a nucleation-friendly species (e.g., Si, Ga) and a knock-off species (e.g., Ar, F) for resp. implant of a nucleation-friendly species within or removal of a nucleation-unfriendly material (e.g., SiO2) of a supplied substrate. The desired single-crystal material is then grown in epitaxial-like manner from the thus-formed seeding-template. In one embodiment, Si ions are projected through a monocryst. Si mask of a selected crystal orientation ((100), or (111)) in its channelizing direction so as to implant the Si ions in a SiO2 layer of a supplied substrate according to the selected crystal orientation of the channelizing mask. Monocryst. Si is then epitaxially grown on top of the SiO2 **layer** with the same crystal **orientation**. Three-dimensional integrated circuits (3-dimensional ULSIC's or UPIC's) may then be formed with this technique. The technique may be extended to many other fields of application that can benefit from economic formation of single-crystal materials, such as optics, optoelectronics, tribol., metallurgy, and so forth.
RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 17 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:405614 HCAPLUS
DN 133:31620
TI Transparent vapor-deposited films based on biaxially oriented propylene polymers and their manufacture
IN Nagahama, Koji
PA Toppan Printing Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

PI	JP 2000168002	A2	20000620	JP 1998-349681	19981209

AB The films, useful for packaging materials, have biaxially oriented propylene polymer layers, PET layers, and transparent and gas-barrier layers vapor deposited on the PET layers. Thus, a biaxially oriented polypropylene film and a PET film were bonded via a urethane-type nonsolvent adhesive and coated with Si oxide and Al2O3 by vapor deposition to give a multilayer film with O permeability 10 cc/m2-24 h, H2O permeability 0.5 cc/m2-24 h, and haze 2.6%.

L7 ANSWER 18 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:232542 HCAPLUS
DN 132:252208
TI Biaxially oriented laminated polyester films for transparent vapor deposition of metal (oxides)
IN Utsumi, Shigeo
PA Mitsubishi Chemical Polyester Film Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2000103023	A2	20000411	JP 1998-275163	19980929

AB The films comprise a polyester layer laminated with another polyester layer showing low-mol.-wt. extn. content with CHCl3 <50 mg/m2 on which a metal (oxide) layer is laminated by vapor deposition. Thus, a blend (A) of 30 parts PET contg. 0.6 parts SiO2 [intrinsic viscosity (IV) 0.65] and 70 parts PET chips (IV 0.60) was coextruded with a polyester (B; low mol. content .ltoreq.0.5%) and biaxially stretched to give an A/B/A laminate film with haze 1.8% and surface roughness 0.028 .mu.m, which was applied to vapor deposition of Al2O3 to give a gas-barrier film.

L7 ANSWER 19 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:378565 HCAPLUS
DN 131:45824
TI Impact-resistant biaxially oriented polyester films having good adhesion to metals and moldability for manufacture of metal cans
IN Kojima, Hiroshi; Kimura, Masahiro; Takahashi, Kozo
PA Toray Industries, Inc., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 11158301	A2	19990615	JP 1997-339369	19971125

AB Title films, esp. useful for beverage cans, contain (i) polyesters prepd. from 80-99 parts ethylene terephthalate (A) unit and 1-20 parts ethylene isophthalate (B) unit and/or ethylene naphthalate unit, (ii) 0.005-1 part particles (Q1) with particle diam. (.vphi.) .gtoreq.0.005 to <0.3 .mu.m, and (iii) 0.01-3 parts particles (Q2) with .vphi. 0.3-3 .mu.m. The wt. ratio of Q1 to Q2 is 0.05-0.5. Thus, a compn. contg. 88:12 A-B copolyester prepd. from di-Me terephthalate, di-Me isophthalate, and ethylene glycol, 0.02 part SiO2 [.vphi. 0.2 .mu.m; length/breadth (L/B) 1.08], and 0.1 part SiO2 (.vphi. 1.5; L/B 1.11) was extruded and quenched to give a film, which was stretched 2.8 times in both the machine and

transverse directions, relaxed, and heat-set. Then, the obtained **film** (plane-**orientation** coeff. 0.109) was laminated with a steel plate, stretch-formed, and heat-treated to give a can, in which water showed little change after 20 min-retort treatment at 120.degree..

L7 ANSWER 20 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:240285 HCAPLUS
DN 131:11409
TI Passive and active matrix liquid crystal displays with **plastic** substrates
AU Lueder, Ernst
CS University of Stuttgart, Institut fuer Netzwerk- und Systemtheorie, Stuttgart, 70569, Germany
SO Proceedings - Electrochemical Society (1999), 98-22(Thin Film Transistor Technologies), 336-354
CODEN: PESODO; ISSN: 0161-6374
PB Electrochemical Society
DT Journal; General Review
LA English
AB Displays with **plastic** substrates are attractive since they are light, thin, virtually unbreakable and flexible e.g. for styling. Main applications are reflective displays for portable systems. Permeation of water and gases through **plastics** must be decreased by barrier layers; the thermal compaction is shrunk by preannealing. A bistable ferroelec. display with **plastic** substrates is described; it exhibits an obliquely sputtered SiO2-**orientation layer** leading to a large mech. stability, which renders it suitable for smart cards and other portable systems. Low temp. PECVD-generated a-Si:H-TFTs are introduced and applied for the addressing of arrays of a-Si-light sensors. The overview is complemented by bistable cholesteric displays, MIM-addressed PDLC-displays, the first poly-Si-TFTs and finally solar cells and batteries with **plastic** substrates. A review with 17 refs.
RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 21 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:23432 HCAPLUS
DN 130:82689
TI Transparent biaxial-**orientation** polyester **films** with good slippage and roll windability
IN Mizutani, Kei; Tomita, Hiroshi
PA Teijin Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11001567	A2	19990106	JP 1997-156824	19970613

PI JP 11001567 A2 19990106 JP 1997-156824 19970613
AB Title films comprise 0.005-0.4% surface-treated inert particles [film thickness 0.5-10 .mu.m; av. particle size of primary particles (APSp) 0.001-0.05 .mu.m; aspect ratio of primary particles (ARp) 1-3; av. aggregation no. constituting secondary particles (AAN; amt. of the primary particle) 50-1000; av. particle size of secondary particles (APSs) 0.05-5.0 .mu.m; aspect ratio of secondary particles when obsd. from the surface of the film (ARs-S) 1-5; secondary particle no. per 1000 .mu.m2 (SPN) 1-20; aspect ratio of secondary particles when obsd. along the

thickness direction and the machine direction of the film (ARs-TM) 1-5; aspect ratio of secondary particles when obsd. along the thickness direction and the transverse direction of the film (ARs-TT) 0.5-2]. The films can be wound smoothly even if the films are prepd. by using recycled **plastic** wastes. Thus, di-Me terephthalate and ethylene glycol were polymd. in the presence of Mn acetate, Sb2O3, phosphorous acid, 0.066% SiO2, and 2.5% (based on SiO2) Na polyacrylate, pelletized, and melt-extruded to give a 65 .mu.m-thick film, which was stretched 3.6 times lengthwise and 3.9 times crosswise, heat-set, and relaxed to give a 4.6 .mu.m-thick film (APSp = 0.002 .mu.m; ARp = 1.2; AAN = 456; APSs = 0.12 .mu.m; ARs-S = 2.4; SPN = 18.2; ARs-TM = 2.5; ARs-TT = 1.3) with good transparency, slippage, and roll windability.

L7 ANSWER 22 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:584099 HCAPLUS
DN 127:237877
TI Microstructure formation in ceramic injection molding
AU Pabst, Willi; Havrda, Jiri; Gregorova, Eva
CS Dep. Glass Ceramics, Institute Chemical Technology Prague, Prague, 16628, Czech Rep.
SO Key Engineering Materials (1997), 132-136(Pt. 1, Euro Ceramics V), 416-419
CODEN: KEMAEY; ISSN: 1013-9826
PB Trans Tech
DT Journal
LA English
AB **Thermoplastic** alumina pastes which serve as a feedstock for ceramic injection molding were modeled as Herschel-Bulkley fluids exhibiting a well defined yield stress value in Poiseuille tube flow. Flow curves of these pastes were detd. for different temps. by rheol. measurements with a specially constructed high temp. capillary viscometer, and based on the known constructive equation, velocity profiles were calcd. and verified for the temps. of interest. Bulk d. measurements and the microscopic evaluation of polished sections revealed the strong correlation between velocity profile and microstructure. Image anal. was used to quantify porosity profiles and particle **orientation** in the shear **layer**.

L7 ANSWER 23 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:402431 HCAPLUS
DN 127:35532
TI Polyester films with good oxygen- and steam-barrier property for transparent vapor deposition
IN Takahashi, Kozo; Kimura, Masahiro; Abe, Koichi
PA Toray Industries, Inc., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09104769	A2	19970422	JP 1996-192056	19960722
PRAI	JP 1995-199899		19950804		

AB Title **films** show surface **orientation** crystal parameter (Ps) .ltoreq.5 in .gtoreq.1 side of the films, which are useful for food packaging materials. The films may be .gtoreq.2-layer laminated polyester films and show Ps .ltoreq.5 in .gtoreq.1 side of the outermost layers. Thus, 0.05% SiO2 particle-contg. poly(ethylene terephthalate) pellets (m.p. = 252.degree.; intrinsic viscosity 0.69 dL/g) were dried,

melt-extruded, rolled on a cooling drum, and impressed with d.c. voltage to give an unoriented film, which was stretched 3.2 times lengthwise at 105.degree. and 3.3 times crosswise at 110.degree., heat-treated at 240.degree., and coated with Al2O3 by vapor deposition to give a transparent vapor-deposition film having Ps = 4.7, surface roughness parameter 19.5 nm, heat shrinkage 0.9 (in machine direction) and +0.3% (in transverse direction), O permeability 2.0 mL/m2-day, and steam permeability 2.1 g/m2-day.

L7 ANSWER 24 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:756412 HCAPLUS
DN 126:67654
TI Liquid crystal display element with gas- and moisture barrier films
IN Sekiguchi, Mamoru; Minato, Takao; Matsuo, Ryukichi; Yoshihara, Toshiaki
PA Toppan Printing Co Ltd, Japan
SO Jpn. Kokai Tokkyo Koho, 18 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08248401	A2	19960927	JP 1995-184770	19950628
PRAI	JP 1994-234946		19940929		
	JP 1995-2129		19950110		

AB In the liq. crystal display element with a liq. crystal sealed between the pair of **plastic** substrates having transparent electrodes and **orientation films** on the inner surface, at least the outer surface (i.e., opposite to the surface where the electrode is formed) of the **plastic** film has inorg. thin film layers. The inorg. thin film layers are made from an inorg. polymer such as a polysilazane precursor, magnesia, and the like. Between the inorg. thin film layers, a transparent resin layer such as a PVA layer may be interposed. The inorg. thin film layer and the electrode layer function together to fill pin holes and cracks formed during film formation processes, and act as gas- and moisture barrier layers.

L7 ANSWER 25 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:610754 HCAPLUS
DN 125:306181
TI **Orientation** dependent crack patterns in alumina **films** on NiAl single crystals due to spherical indentation
AU Hollatz, M.; Bobeth, M.; Pompe, W.; Marx, V.
CS Res. Group Mechanics Heterogeneous Solids, Max-Planck-Gesellschaft, Dresden, D-01069, Germany
SO Acta Materialia (1996), 44(10), 4149-4159
CODEN: ACMAFD; ISSN: 1359-6454
PB Elsevier
DT Journal
LA English
AB Spherical indentations on (100), (110) and (111) oriented NiAl at room temp. caused anisotropic surface topogs. around the indentations which revealed the highly anisotropic **plastic** deformation of NiAl. No cracks were obsd. at the surface of non-oxidized specimens. For oxidized specimens, radial and circumferential-like cracks in the alumina film around the indentation indicated circumferential and radial tensile strains at the NiAl surface depending on the in-plane crystallog. direction. Unlike the case of isotropic **plastic** deformation on (100) NiAl, a sinking-in of the surface at the indentation periphery was

connected with circumferential tensile strains in special directions as indicated by the appearance of radial cracks.

L7 ANSWER 26 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 1992:458402 HCAPLUS
DN 117:58402
TI Manufacture of nonlinear optical **polymeric materials**
IN Nonaka, Takeshi; Hosoya, Toshifumi; Kobayashi, Takehito; Matsuda, Hiroo
PA Sumitomo Electric Industries, Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 04007525	A2	19920110	JP 1990-108776	19900426

AB The manufg. process comprises the steps of: forming a composite contg. a prepolymer and a nonlinear optical material; thermal- or radiation-curing the composite in an applied voltage, wherein an insulator undercoat is formed between the (pre)polymer and the electrode coating. The insulator coating blocks the current flow that deteriorates the nonlinearity of the material.

L7 ANSWER 27 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 1988:196023 HCAPLUS
DN 108:196023
TI Thermal-transfer materials with an amorphous aluminum oxide backcoat layer
IN Oshima, Katsunori; Hayashi, Kenji
PA Toray Industries, Inc., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 62225393	A2	19871003	JP 1986-68493	19860328

AB Thermal-transfer materials are prepd. by forming a heat-sensitive ink layer on 1 side of a biaxially oriented **plastic** film substrate with a thickness of 1-10 .mu. and forming an amorphous Al oxide thin layer on the back side. The materials are adaptable to high speed recording processes and exhibit high resoln. and good antisticking properties. Thus, a biaxially oriented PET film (3.6 .mu. thick) was coated with Al oxide by reactive CVD on 1 side to form a thin layer (300 .ANG. thickness; n = 1.58) and coated with a compn. contg. carnauba wax, ester wax, C black, polytetrahydrofuran, and silicone oil on the other side to give a thermal-transfer material. The material gave high quality images with high resoln. and showed good antisticking properties compared to a control without the thin layer.

L7 ANSWER 28 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 1988:42256 HCAPLUS
DN 108:42256
TI Monte Carlo simulation of the lamellar structure of thermally sprayed coatings
AU Knotek, O.; Elsing, R.
CS Inst. Werkstoffk., RWTH Aachen, Aachen, D-5100, Fed. Rep. Ger.
SO Surf. Coat. Technol. (1987), 32, 261-71

CODEN: SCTEEJ
DT Journal
LA English
AB The structure of thermally sprayed coatings is principally characterized by its lamellar nature and more or less high porosity. This structure is created by impacting molten or highly **plastic** particles on the substrate surface or existing partial coating. The process by which discrete molten particles impact at random points within a surface area can be simulated using the Monte Carlo method. An appropriate computation model is presented. Structural parameters such as the size of the lamellae, their orientation with respect to the substrate surface, and the variation in lamellar **orientation** over the **coating** cross-section are detd. using simulated coating structures. The impact energies of the spray particles at the moment of impact serve as input data to the model. The results of simulation can be used to interpret phenomena obsd. in real plasma-sprayed coatings such as substrate-near crack propagation in adhesive strength tests and energy-dependent adhesive strength test values.

L7 ANSWER 29 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 1987:130512 HCAPLUS
DN 106:130512
TI Preparation of magnetic recording media
IN Kovacs, Jenoe; Engelhardt, Peter; Roller, Hermann; Schwarz, Lothar; Nagel, Peter
PA BASF A.-G. , Fed. Rep. Ger.
SO Ger. Offen., 7 pp.
CODEN: GWXXBX
DT Patent
LA German
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 3526415	A1	19870205	DE 1985-3526415	19850724
	US 4775553	A	19881004	US 1986-887936	19860722
PRAI	DE 1985-3526415		19850724		

AB Powd. magnetic material is dispersed in a mixt. of solvent, org. polymer binder, dispersing agent, and other additives in a conventional dispersing app. with special ceramic grinding elements. The resulting dispersion is spread on a carrier material and solidified. Acicular Fe powder, spherical Al2O3 powder, a **thermoplastic** polyester urethane soln., and a phenoxy resin soln. were dispersed 32 h in a mill contg. spheres of 69% ZrO2-31% SiO2 1-1.5 mm in diam., with addn. of stearic acid and a dispersing agent based on a mixt. of an ethoxylated monophosphoric acid ester and a salt of ethylhexyl sulfosuccinate. Then a soln. of a triisocyanate prepd. from toluenediisocyanate and 1,1,1-trimethylolpropane in EtOAc was added and the mixt. was stirred another 15 min. After filtering, the dispersion was spread on a poly(ethylene terephthalate) **film** with **alignment** of the magnetic particles by a permanent magnet. After drying and pressing between rolls at 200 kg/cm and 90.degree., the magnetic layer had roughness 0.18 .mu.m, coercive force 107.6 kA/m, magnetic remanence 307 milliteslas, and signal/noise ratios of +9 and +5 decibels for luminance and chroma, resp.

L7 ANSWER 30 OF 30 HCAPLUS COPYRIGHT 2002 ACS
AN 1974:15974 HCAPLUS
DN 80:15974
TI **Plastic** tissues
IN Suzuki, Shigemasa; Nakamura, Kohzoh; Kikuchi, Hiroaki; Yasuda, Tsutomu

PA Sanyo Kokusaku Pulp Co., Ltd.
SO Jpn. Tokkyo Koho, 3 pp.
CODEN: JAXXAD
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 48004640	B4	19730209	JP 1969-52187	19690703

PI
AB Moisture-absorbing porous **plastic** film for use as toilet tissue was prepd. by mixing 100 vol. parts **thermoplastic** resin with 30-150 vol. parts fine porous filler above the m.p. of the resin, extruding and calendering the compn. while biaxially stretching to give **orientation** to the **film**. Vinyl acetate-vinyl chloride copolymer [9003-22-9] 100, TiO2 3, CaCO3 30, kieselguhr 20, and pulp dust 20 vol. parts were mixed at 145-70.deg., pelleted, extruded at a die temp. 150.deg., calendered and biaxially stretched to give a white film with the same moisture-absorbing capacity as tissue paper.

L11 ANSWER 1 OF 3 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:260351 HCAPLUS
DN 136:280383
TI Method for manufacturing biaxially oriented polyamide films with excellent gas- and moisture-barrier properties and transparency
IN Fujita, Shinji; Mukoyama, Yukinobu; Ito, Katsuya
PA Toyobo Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002103446	A2	20020409	JP 2000-299625	20000929

AB The films, useful for packaging foods, pharmaceuticals, and electronic parts, are manufd. by preheating unoriented polyamide sheets having A/B, A/B/A, or A/B/C layer structure and stretching the sheets by using linear motor-type tenters, wherein A layer contains compns. (X) contg. mixts. and/or copolymers of .gtoreq.10 mol% arom. polyamides (prepd. from terephthalic acid and aliph. diamines or adipic acid and m-xylylenediamine) and aliph. polyamides or arom. polyamides (prepd. from isophthalic acid and aliph. diamines) and optionally aliph. polyamides (Y), B layer contains Y and optionally X and/or bending fatigue resistance improvers (Z), and C layer contains X and/or Y. Thus, a sheet having A/B/A structure (A = a 35:65 mixt. of nylon 6 and nylon 6T-nylon 6 copolymer; B = nylon 6) was preheated at 53.degree., stretched at 130.degree. 3.4-fold and 4.0-fold in the longitudinal and transverse direction, resp., deposited with a SiO2-**Al2O3** mixt., and laminated with a polyethylene layer to give a test piece showing (after immersing in H2O at 95.degree. for 30 min) O permeability 78 cc/m2-atm-day , steam permeability 5 g/m2-day, and adhesion strength 2740 g/15 mm.

L11 ANSWER 2 OF 3 HCAPLUS COPYRIGHT 2002 ACS
AN 1993:627605 HCAPLUS
DN 119:227605
TI Color prepreg sheet and its manufacture and fiber-reinforced resin products with cord pattern
IN Morii, Akira; Wada, Toji
PA Sumitomo Chemical Co, Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 05156046	A2	19930622	JP 1991-322942	19911206

AB The title sheet composed of continuous fiber-reinforced synthetic resins in which the fibers are parallelly **aligned** and **coated** · with color agents is obtained by pressing, on heating, of the fibers into a resin film coated on a release paper and dyed with coloring agents. Thus, a compn. of bisphenol A-based epoxy resins with Sumiepoxy ESCN 220H, curing agent, and curing catalyst was melted and mixed with Al powders and Iriodin 163 to give a matrix, which was coated onto a release paper to give a film; Altex Al-based synthetic fibers were pressed into the epoxy film and dyed with coloring agents to form a pattern-bearing prepreg sheet which was cured on a metal bar and then ground to give a pipe-shaped

product with designed pattern.

L11 ANSWER 3 OF 3 HCAPLUS COPYRIGHT 2002 ACS
AN 1973:47257 HCAPLUS
DN 78:47257
TI Providing substances with stiff reinforcing material
IN Feakes, Frank; Padawer, Gabriel E.
PA National Research Corp.
SO U.S., 5 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 3702261	A	19721107	US 1969-792969	19690122

AB Ductile metal, such as Ti, or **plastic** core, such as polyimide, substrates are coated with a stiff reinforcing material by supporting the substrate with .gtoreq.2 surfaces in a coating zone, providing a vaporizable source of a stiff reinforcing coating in this zone and line of sight with the core substrate. This source was selected from **Al2O3**, B, B4C, C, SiC, TiB2, TiC, Al boride, and Be. A vacuum was established in the coating zone, the substrate was heated, and the reinforcing material was vaporized and condensed on the core to coat it. The relative **orientation** of the substrate and stiff **coating** material was alternated in a series of repetitive cycles so that 1st one and then another of the surfaces of the substrate faced toward the source alternatively coating in different time portions of each cycle to build a no. of coating sublayers on these surfaces; each sublayer had a thickness .ltoreq.0.05 mil. For example, a Ti foil substrate was mounted in a vacuum coater. The source was charged with B4C, preheated, and coated for 3 min with a 3-4 sec exposure of each side of the substrate per cycle for 50 complete revolutions. A total coating of 0.113 mil B4C was deposited on each side giving a total vol. fraction of 26.7% B4C in the coated sample. The coated sample had a d. of 0.116 lb/in.3, an elastic modulus of 23.9 .times. 106 psi, and a stress of 36.8 .times. 103 psi.

L15 ANSWER 1 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:570736 HCAPLUS
TI Method of **homeotropic** alignment or tilted **homeotropic** alignment of liquid crystals by single oblique evaporation of oxides, and liquid crystal display device formed thereby
IN Lu, Minhua; Yang, Kei-Hsiung
PA International Business Machines Corporation, USA
SO U.S., 10 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6426786	B1	20020730	US 1999-323044	19990601

AB A single-domain, two-domain or four-domain **homeotropic**- or tilted **homeotropic**-alignment liq. crystal display device of either the transmissive-type or reflective-type having a high contrast ratio, a good display quality, and a high photostability includes a **homeotropic**- or tilted **homeotropic-alignment layer** which includes an oxide **layer** prepd. by single oblique evapn. The angle between the evapn. direction and the substrate plane forms an angle from about .+-.20.degree. to about .+-.90.degree., and the thickness of the oxide layer is from .apprx.10 to .apprx.200 nm. A method of **homeotropic**-alignment or tilted **homeotropic** -alignment of liq. crystals by a single oblique evapn. process is also provided.
RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 2 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:364268 HCAPLUS
DN 136:362847
TI Ferromagnetic memory devices and method for outputting data from them
IN Hirai, Masahiko
PA Canon Inc., Japan
SO Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002140889	A2	20020517	JP 2000-334492	20001101

AB The device includes a variable resistor (A) having a magnetic hard layer for recording data by the magnetic **orientation**, a nonmagnetic **layer**, and a magnetic soft layer having coercive force smaller than that of the hard layer, a magnetic field-generating means (B) for initializing the soft layer, a circuit (C) for keeping a resistance in the initialization condition, and a signal-detecting circuit (D). The device may include plural parallel bit lines, plural parallel word lines **perpendicular** to the bit lines, and earthed switching elements on a semiconductor substrate, wherein the elements and resistors are placed at intersections of the bit and word lines and each resistor is connected to the resp. element and bit line. The method, giving 1T1R (1-transistor 1-magnetoresistance element)-type MRAM with a small cell area and stable outputting properties, contains initiallizing the soft layer while detecting and keeping a resistance, reversing the magnetization of the

layer, and comparing the resistance after the reversal process with the resistance kept by C.

L15 ANSWER 3 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:362669 HCAPLUS
DN 136:410354
TI Exchange coupling and spin-flip transition of CoFe2O4/.alpha.-Fe2O3 bilayered films
AU Fujii, Tatsuo; Yano, Takuya; Nakanishi, Makoto; Takada, Jun
CS Department of Applied Chemistry, Faculty of Engineering, Okayama University, Tsushima-naka 3-1-1, Okayama, 700-8530, Japan
SO Materials Research Society Symposium Proceedings (2001), 674(Applications of Ferromagnetic and Optical Materials, Storage and Magnetoelectronics), T1.10.1-T1.10.6
CODEN: MRSPDH; ISSN: 0272-9172
PB Materials Research Society
DT Journal
LA English
AB CoFe2O4/.alpha.-Fe2O3 (ferrimagnetic/antiferromagnetic) bilayered films were prepd. on .alpha.-**Al2O3**(102) single-cryst. substrates by helicon plasma sputtering. A well-crystd. epitaxial .alpha.-Fe2O3(102) layer was formed on the substrate, while CoFe2O4 grown on .alpha.-Fe2O3 (102) was a polycryst. **layer** with a (100)-preferred **orientation**. The .alpha.-Fe2O3(102) films without CoFe2O4 layers clearly showed a spin-flip transition at .apprxeq.400 K. The spins **aligned perpendicular** to the **film** plane at room temp. changed their direction within the film plane above 400 K. However the .alpha.-Fe2O3 base layers of CoFe2O4/.alpha.-Fe2O3 bilayered films did not show any spin-flip transition. The CoFe2O4 layer on .alpha.-Fe2O3 had a large in-plane magnetic anisotropy, while the spin axis of the .alpha.-Fe2O3 (102) base layer was directed **perpendicular** to the film plane. The magnetization of ferrimagnetic CoFe2O4 layers was coupled perpendicularly to the spin axis of antiferromagnetic .alpha.-Fe2O3 layers due to the exchange coupling at the interface between CoFe2O4 and .alpha.-Fe2O3.
RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 4 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:236453 HCAPLUS
DN 136:238814
TI Long-wavelength VCSELs and method of manufacturing same
IN Forrest, Stephen; Gokhale, Milind R.; Wang, Hongsheng
PA The Trustees of Princeton University, USA
SO U.S., 12 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6362069	B1	20020326	US 2000-750195	20001228

AB Methods of fabricating a VCSEL wafer using a flip-bonding process are described entailing forming registration marks on the top surface of a VCSEL wafer, the registration marks extending through VCSEL **layers** to an InP substrate **layer**; **aligning** a VCSEL aperture mask to the registration marks; mounting the wafer face down on a surrogate substrate; removing the InP substrate so that the registration marks become visible; and aligning features on the top surface using the

registration marks. The methods may also entail forming an InAsP/InGaAsP MQW VCSEL wafer on an InP substrate; forming a VCSEL aperture on the wafer; flip-bonding the wafer onto a surrogate substrate; removing the InP substrate; forming a Ti/Pt/Au top ring electrode and contact pad on the wafer; isolating each VCSEL etching down to near an active region; and depositing dielec. mirror stack on the isolated VCSEL.

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 5 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2002:135206 HCAPLUS
DN 136:251249
TI Growth mechanism of reactively sputtered aluminum nitride thin films
AU Hwang, Bing-Hwai; Chen, Chi-Shan; Lu, Hong-Yang; Hsu, Tzu-Chien
CS National Sun Yat-Sen University, Institute of Materials Science and Engineering, Kaohsiung, 80424, Taiwan
SO Materials Science & Engineering, A: Structural Materials: Properties, Microstructure and Processing (2002), A325(1-2), 380-388
CODEN: MSAPE3; ISSN: 0921-5093
PB Elsevier Science B.V.
DT Journal
LA English
AB Aluminum nitride (AlN) thin films grown on the Si (1 0 0) by radio frequency sputtering have been analyzed by X-ray diffractometry, SEM and TEM. The films of .apprx.3 .mu.m thick exhibit the [0 0 0 1] preferred growth direction where columnar AlN crystals are grown in a non-epitaxial pattern and aligned almost **perpendicular** to the SiO2-Si substrate surface. Detailed microstructural anal. from the cross-section TEM of the thin films reveals three areas including the Si substrate (layer (a)), the SiO2 (layer (b)), and the AlN film (layer (c)-(f)). The deposited AlN film appears to consist of four distinct layers characterized by their cryst. phases and grain crystallog. orientations. These include the (c) reaction, (d) transition, (e) **alignment**, and (f) surface **layers**. The reaction layer (c) is composed of .alpha.-**Al2O3** ppts. in an amorphous matrix. Randomly oriented AlN grains start to form in the lower end and become better aligned towards the upper end of the transition layer (d). In **layer** (e), well-**aligned** AlN grains have developed to form distinct columnar structure, which continues to grow in size in the surface layer (f). The microstructural observation has enabled us to propose a growth mechanism involving the influence from .alpha.-**Al2O3**.

RE.CNT 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 6 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:621957 HCAPLUS
DN 135:230076
TI Microstructural study of epitaxial platinum and permalloy/platinum films grown on (0001) sapphire
AU Ramanathan, Shriram; Clemens, Bruce M.; McIntyre, Paul C.; Dahmen, Ulrich
CS Department of Materials Science and Engineering, Stanford University, Stanford, CA, 94305, USA
SO Philosophical Magazine A: Physics of Condensed Matter: Structure, Defects and Mechanical Properties (2001), 81(8), 2073-2094
CODEN: PMAADG; ISSN: 0141-8610
PB Taylor & Francis Ltd.
DT Journal
LA English
AB Detailed TEM study of epitaxial Pt films of 500.ANG. thickness grown by

sputtering on single-crystal sapphire (0001) substrates is reported. The **orientation** relation between the Pt **film** and the substrate was detd. to be (111)||(0001)**Al2O3**, [110]Pt||[10.hivin.10]**Al2O3**. As a result of this relation there are two orientation variants, related to each other by 60.degree. rotation about the [111] axis. Microstructural anal. using rose plots showed a large fraction (82%) of the grain boundaries oriented parallel to preferred facets along <110> directions. Although facet orientations occur every 60.degree., facet junctions prefer 120.degree. angles. The films exhibited the mazed bicrystal structure, with larger grains displaying increasingly convoluted shapes, a behavior that was quantified using the external form factor to describe grain morphologies. From high-resoln. imaging of cross-section samples, the preferred boundaries were **perpendicular** to the substrate and were identified as .EPSILON. = 3, {112} sym. tilt boundaries. Quant. anal. of high-resoln. micrographs using the geometric phase technique shows a rigid shift of 0.3d{111} parallel to the interface where the boundary is not constrained by the rigid substrate. Lattice images taken along the sapphire [1210] and [1010] zone axes revealed a sharp interface between the Pt and the sapphire with no intermediate phases. The possible reasons for twinning in these films are discussed in detail, and the twin variants nucleate at the initial stages of island growth. Finally, the growth of epitaxial 200.ANG. Ni-Fe films on Pt underlayer is also reported. The Ni-Fe film grows as a bicrystal with the twin boundaries correlated to those of Pt. These results clearly show the importance of control the microstructure of the seed layer to grow defect-free multilayers.

RE.CNT 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 7 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:491805 HCAPLUS
DN 135:219372
TI Growth of c-oriented MgB2 thin films by pulsed laser deposition: structural characterization and electronic anisotropy
IN Ferdeghini, C.; Ferrando, V.; Grassano, G.; Ramadan, W.; Bellingeri, E.; Braccinil, V.; Marre, D.; Manfrinetti, P.; Palenzona, A.; Borgatti, F.; Felici, R.; Lee, T.-L.
SO Los Alamos National Laboratory, Preprint Archive, Condensed Matter, No pp. given, arXiv:cond-mat/0107031
CODEN: LNCMFR
URL: http://xxx.lanl.gov/pdf/cond-mat/0107031
DT Preprint
LA English
AB MgB2 thin films were deposited using pulsed laser deposition (PLD) and ex-situ annealing in a Mg atm. The films presented crit. temps. up to 36 K and turned out to be preferentially c-oriented both on **Al2O3** (r-cut) and MgO(100) substrates. Synchrotron analyses gave also some indications of in-plane texturing. The films exhibited a very fine grain size (1200 .ANG. in the basal plane and 100 .ANG. along the c-axis), but the general resistivity behavior and the remarkable extension of the irreversible region confirm that the grains boundaries are not barriers for supercurrents. Upper crit. field measurements with the magnetic field **perpendicular** and parallel with respect to the film surface evidenced a field anisotropy ratio of 1.8. The Hc2-values are considerably higher with respect to the bulk ones, namely when the field lies in the basal plane, and the field-temp. phase diagram for the two magnetic field orientations suggest the possibility of strongly enhancing the pinning region by means of texturing.

RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 8 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:131332 HCAPLUS
DN 134:288060
TI Rutherford backscattering/channeling study of a thin AlGaN layer on **Al2O3**(0001)
AU Wu, M. F.; Vantomme, A.; Hogg, S.; Langouche, G.; Van der Stricht, W.; Jacobs, K.; Moerman, I.
CS Department of Technical Physics, Peking University, Beijing, 100871, Peop. Rep. China
SO Nuclear Instruments & Methods in Physics Research, Section B: Beam Interactions with Materials and Atoms (2001), 174(1-2), 181-186
CODEN: NIMBEU; ISSN: 0168-583X
PB Elsevier Science B.V.
DT Journal
LA English
AB A thin AlGaN layer, which is suitable for structural study using Rutherford backscattering (RBS)/channeling, was grown on an **Al2O3** (0001) substrate by metalorg. CVD. The results show that the compn. of the epilayer is Al0.05Ga0.95N and that although the epilayer is very thin (79 nm), it has a good cryst. quality (.chi.min=1.9%). The azimuthal orientation of the AlGaN epilayer relative to the **Al2O3** substrate is AlGaN[0001] .dblvert.**Al2O3**[0001] and AlGaN{11.hivin.20}.dblvert.**Al2O3**{10.hivin.10}, showing that the AlGaN epilayer is rotated by 30.degree. around the [0001] axis with respect to the **Al2O3** substrate which decreases the lattice mismatch between the epilayer and the substrate significantly. RBS angular scan was used to det. the strain-induced tetragonal distortion of the epilayer. Combined with x-ray diffraction, the **perpendicular** and parallel elastic strains of the AlGaN layer, e.perp. = +0.31% and e.dblvert. = -0.28%, can be calcd.
RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 9 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:129360 HCAPLUS
DN 134:274781
TI Oriented PbFe12O19 thin films prepared by pulsed laser deposition on sapphire substrate
AU Diaz-Castanon, S.; Leccabue, F.; Watts, B. E.; Yapp, R.; Asenjo, A.; Vazquez, M.
CS Facultad de Fisica-IMRE, Universidad de La Habana, Havana, Cuba
SO Materials Letters (2001), 47(6), 356-361
CODEN: MLETDJ; ISSN: 0167-577X
PB Elsevier Science B.V.
DT Journal
LA English
AB PbFe12O19 hexaferrite thin **films** with a high degree of **orientation** in the **perpendicular** direction have been deposited by pulsed laser ablation on 1.times.1-cm2 (0001) sapphire substrate at 700.degree. under 3.0 mbar partial pressure of high purity O. The anisotropic character of the films was demonstrated by a remanence ratio of 86% in the **perpendicular** direction in contrast with to 20% in the parallel direction to the film plane. The x-ray diffraction anal. confirmed this orientation, showing only the (0001) lines of PbFe12O19 compd. The hexagonal lattice parameters detd. were a = 5.885 A and c 23.066 A. Moderate values of coercive field (2.5 kOe) and satn. magnetization (165 emu/cm3) were obtained.

RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 10 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:87244 HCAPLUS
DN 134:254306
TI Parallel synthesis of ZSM-5 zeolite films from clear organic-free solutions
AU Lai, Re; Kang, Beom Seok; Gavalas, George R.
CS Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA, 91125-4100, USA
SO Angewandte Chemie, International Edition (2001), 40(2), 408-411
CODEN: ACIEF5; ISSN: 1433-7851
PB Wiley-VCH Verlag GmbH
DT Journal
LA English
AB Parallel synthesis of ZSM-5 zeolite films was demonstrated using a 21-well reactor. Holding the substrate **vertically** provided uniform wetting of the substrate in the well area and favored heterogeneous film growth. The films prepd. by parallel synthesis have similar morphol. to those synthesized under conventional conditions but their x-ray diffraction patterns indicate lesser orientation of crystallites. Parallel synthesis was used to screen the compn. space of org.-free clear synthesis soln. for ZSM-5 film growth. The compn. SiO2:(0.5-0.7)NaOH:(1/300-1/700)**Al2O3**:80H2O resulted in continuous ZSM-5 films of Si/Al .apprx. 20:1.
RE.CNT 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 11 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:69880 HCAPLUS
DN 134:246329
TI Growth-induced **perpendicular** magnetic anisotropy and clustering in NixPt1-x alloys
AU Vasumathi, D.; Shapiro, A. L.; Maranville, B. B.; Hellman, F.
CS Physics Department, University of California San Diego, La Jolla, CA, 92093, USA
SO Journal of Magnetism and Magnetic Materials (2001), 223(3), 221-232
CODEN: JMMMDC; ISSN: 0304-8853
PB Elsevier Science B.V.
DT Journal
LA English
AB Polycryst. and epitaxial (1 0 0), (1 1 0), and (1 1 1)-oriented Ni3Pt, NiPt, and NiPt3 films were deposited over a range of growth temps. at 80-700.degree.. Films grown at moderate temps. (200-400.degree.) exhibit growth-induced properties similar to Co-Pt alloys: enhanced and broadened Curie temp., **perpendicular** magnetic anisotropy and large coercivity. As in Co-Pt, the magnetic properties suggest a clustering of Ni into platelets on the growth surface, as the films are being grown. Unlike Co-Pt, however, NiPt **films** exhibit a strong **orientational** dependence of anisotropy and enhanced Curie temp., possibly resulting from different types of surface reconstructions which affect the growth surface.
RE.CNT 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 12 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:43394 HCAPLUS
DN 134:94633

TI Thin **film** magnetic head with self-**aligned** pole tips
IN Hsiao, Yun-lin; Wang, Lien-chang; Ravipati, Durga I.; Hiner, Hugh C.; Jensen, William D.
PA Read-Rite Corporation, USA
SO U.S., 12 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6173486	B1	20010116	US 1997-810862	19970304

AB A magnetic head includes 1st and 2nd pole tips sepd. by a nonmagnetic gap layer. The right side walls of the 1st and 2nd pole tips are **vertically** aligned. Similarly, the left side walls of the 1st and 2nd pole tips are **vertically** aligned. The side fringing flux is substantially reduced resulting in a magnetic head capable of writing data tracks with well defined boundaries. The fabrication of the magnetic head begins with forming a stack of layers on a substrate. The stack of layers includes a nonmagnetic layer sandwiched between the 1st pole tip layer and a sacrificial layer which is preferably made of a metal. A protective layer, such as alumina, is then deposited over and around the stack of layers. After planarization and ion milling, the sacrificial layer is exposed. The sacrificial layer is then etched away leaving a vol. of space in the protective layer and above the gap layer. An inductive coil with assocd. dielec. layers are then deposited above the 1st pole layer. The 2nd pole layer is thereafter deposited over the inductive coil and into the vol. of space resulting in the 1st and 2nd pole tips having **vertically** aligned side walls.
RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 13 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:900361 HCAPLUS
DN 134:49066
TI White light source using carbon nanotubes and fabrication method thereof
IN Lee, Cheol-Jin; Yoo, Jae-Eun
PA Iljin Nanotech Co., Ltd., S. Korea
SO Eur. Pat. Appl., 17 pp.
CODEN: EPXXDW
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1061554	A1	20001220	EP 2000-304889	20000609
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2001015077	A2	20010119	JP 2000-177789	20000614
CN 1277456	A	20001220	CN 2000-109268	20000615
PRAI KR 1999-22415	A	19990615		
KR 1999-23047	A	19990618		
KR 2000-30355	A	20000602		

AB White light sources are described which comprise a metal cathode film formed on a lower substrate; a catalytic metal film formed on the metal film: carbon nanotubes for emission of electrons in an applied elec. field **vertically aligned** on the catalytic metal **film** ; spacers mounted on the catalytic metal film; and a transparent upper substrate to which a transparent anode is attached and to which in turn a

fluorescent body is attached, the transparent upper substrate being mounted on the spacers so that the fluorescent body faces the carbon nanotubes. Methods of fabricating the light sources are described which entail forming a metal film used as a cathode on a lower substrate; forming a catalytic metal film on the metal film; growing carbon nanotubes for emission of electrons in an applied elec. field to be **vertically aligned** on the catalytic metal **film** ; mounting spacers on the catalytic metal film; mounting a transparent upper substrate having a transparent electrode having a fluorescent body on the spacers so that the fluorescent body faces the carbon nanotubes; and sealing the transparent upper substrate with the lower substrate. The metal film may be formed of Cr, Ti, TiN, W, or Al. The catalytic metal film may be formed of Co, Ni, Fe, Y, or an alloy of .gtoreq.2 of these.

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 14 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:858090 HCAPLUS
DN 134:94555
TI Epitaxial PbFe12O19 hexaferrite film grown by pulsed laser ablation
AU Diaz-Castanon, S.; Leccabue, F.; Watts, B. E.
CS Laboratorio de Magnetismo, Ftad de Fisica-IMRE, Universidad de La Habana, 10400, Cuba
SO Surface Science and Its Applications, Proceedings of the Latin American Congress, 9th, La Habana, Cuba, July 5-9, 1999 (2000), Meeting Date 1999, 395-397. Editor(s): De Melo, Osvaldo; Hernandez-Calderon, Isaac. Publisher: World Scientific Publishing Co. Pte. Ltd., Singapore, Singapore.
CODEN: 69ARJT
DT Conference
LA English
AB Epitaxial PbFe12O19 hexaferrite films were grown using Pulsed Laser Ablation Deposition (PLD) technique on 1.times.1 cm2 (0001) sapphire substrate. A XeCl excimer laser was operated with an energy d. of 2 J/cm2 at a repetition rate of 5 Hz and with the substrate temp. of 650-750.degree. under 3 mbar partial pressure of high purity O. A clear evidence of the anisotropic character of the **films** obtained was the **orientation** coeff. Mr/Ms, 0.86 in the **perpendicular** direction and 0.20 in-plane direction. X-ray diffraction anal., AFM and SEM observations confirm these results. The best film was obtained at 700.degree. under 3.0 mbar O pressure, with a satn. magnetization Ms = 170 emu/cm3 and a coercivity iHc = 2.5 kOe in the **perpendicular** direction.

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 15 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:373356 HCAPLUS
DN 133:97012
TI Threading dislocation density reduction in GaN/sapphire heterostructures
AU Kvit, A.; Sharma, A. K.; Narayan, J.
CS NSF Center for Advanced Materials and Smart Structures, Department of Materials Science and Engineering, North Carolina State University, Raleigh, NC, 27695-7916, USA
SO Materials Research Society Symposium Proceedings (2000), 595(GaN and Related Alloys--1999), W3.56.1-W3.56.6
CODEN: MRSPDH; ISSN: 0272-9172
PB Materials Research Society
DT Journal

LA English
AB Large lattice mismatch between GaN and .alpha.-**Al2O3** (15%) leads to the possibility of high threading dislocation densities in the nitride layers grown on sapphire. This study focused on defect redn. in GaN epitaxial thin layer was studied as a function of processing variables. The microstructure changes from threading dislocations normal to the basal plane to stacking faults in the basal plane. The plan-view TEM and the corresponding selected-area diffraction patterns show that the **film** is single crystal and is **aligned** with a fixed epitaxial orientation to the substrate. The epitaxial relation is (0001)GaN.dblvert.(0001)Sap and [01-10]GaN.dblvert.[-12-10]Sap. This is equiv. to a 30.degree. rotation in the basal (0001) plane. The film contains a high d. of stacking faults with av. spacing 15 nm terminated by partial dislocations. The d. of partial dislocations was estd. from plan-view TEM image to be 7 .times. 109 cm-2. The cross-section image of GaN film shows the d. of stacking faults is highest in the vicinity of the interface and decreases markedly near the top of the layer. Inverted domain boundaries, which are almost **perpendicular** to the film surface, are also visible. The concn. of threading dislocation is relatively low (.apprx.2 .times. 108 cm-2), compared to misfit dislocations. The av. distance between misfit dislocations is 22 .ANG.. Contrast modulations due to the strain near misfit dislocations are seen in high-resoln. cross-sectional TEM micrograph of GaN/.alpha.-**Al2O3** interface. This interface is sharp and does not contain any transitional layer. The interfacial region has a high d. of Shockley and Frank partial dislocations. Mechanism of accommodation of tensile, sequence and tilt disorder through partial dislocation generation is discussed. To achieve low concn. of threading dislocations one needs to establish favorable conditions for some stacking disorder in thin layers above the film-substrate interface region.
RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 16 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:264233 HCAPLUS
DN 133:24844
TI **Orientation** control of ZnO thin **film** prepared by CVD
AU Funakubo, Hiroshi; Mizutani, Nobuyasu; Yonetsu, Maki; Saiki, Atsushi; Shinozaki, Kazuo
CS Department of Inorganic Materials, Faculty of Engineering, Tokyo Institute of Technology, Tokyo, 152, Japan
SO Journal of Electroceramics (2000), Volume Date 1999, 4(Suppl. 1), 25-32
CODEN: JOELFJ; ISSN: 1385-3449
PB Kluwer Academic Publishers
DT Journal
LA English
AB The **orientations** of ZnO **films** parallel and **perpendicular** to the surface of the substrate were studied as functions of the deposition temp. and substrate material. The degree of orientation increased with increasing deposition temp. and became perfectly oriented at a characteristic temp. At a deposition temp. of 620.degree., polycryst. films were obtained on polycryst. **Al2O3**; substrates. (001) Oriented films were obtained on fused SiO2 and (100) rutile substrates. Epitaxially grown (110) and (001) oriented films were obtained on various kinds of single crystal substrates. The difference between the (110) and (001) orientations was explained by the lattice mismatch between the films and the substrates. Epitaxial growth of films exhibiting two directions was obsd. when the two equiv. directions of lattice mismatch existed. These results show the possible formation of

various types of the crystallog. relations between the grains in the film.
RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 17 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:91400 HCAPLUS
DN 132:268626
TI Design of Si3N4 based layered composites for multifunctional application
AU Lences, Z.; Sajgalik, P.; Roncari, E.; Hirao, K.
CS Slovak Academy of Sciences, Institute of Inorganic Chemistry, Bratislava, SK-84236, Slovakia
SO Key Engineering Materials (2000), 175-176(Engineering Ceramics '99: Multifunctional Properties--New Perspectives), 173-182
CODEN: KEMAEY; ISSN: 1013-9826
PB Trans Tech Publications Ltd.
DT Journal
LA English
AB Multifunctional Si3N4/(.beta.-SiAlON+TiN) layered composites were prepd. from tape casted sheets by in situ reactions and subsequent hot pressing. The bending strength and fracture toughness of layered materials measured in direction normal to the layer interface were substantially greater (1184 MPa and 9.75 MPa m1/2) in comparison to the bulk .beta.-SiAlON+TiN composite (647 MPa and 4.71 MPa m1/2). High anisotropy was achieved for the elec. resistance of the layered materials in parallel (6.10-2 .OMEGA.cm) and **perpendicular** (5.1011 .OMEGA.cm) direction to the **layer alignment**.
RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 18 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:64477 HCAPLUS
DN 132:174165
TI Partial melt processing and properties of Bi2Sr2CaCu2O8+x superconducting thick films
AU Sam, Do Thi; Manh, Dinh Hung; Le Van Hong; Hiep, Duong Cong
CS Physics Department, The Pedagogic University of Hanoi, Vietnam
SO Communications in Physics (Hanoi) (1999), 9(2), 92-97
CODEN: CMPYEL; ISSN: 0868-3166
PB Vietnam National Centre for Natural Sciences and Technology
DT Journal
LA English
AB The Bi2Sr2CaCu2O8+x (2212) thick films were prepd. by the partial melt processing on **Al2O3** substrates. The phase purity of the films was controlled by x-ray diffraction spectra. The results show that the films are superconducting 2212 pure phase and c direction oriented **perpendicular** to substrate surface. The **orientation** of **films** also was searched by Raman spectra at room temp. (300 K). The crit. temp. Tc detd. from temp. dependence of resistivity of the films is .apprxeq.85 K with .DELTA.Tc = 2 K. Based on an 1 .mu.V criteria the transport crit. current of films was described and its highest value is of .apprxeq.102 A/cm2.
RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 19 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:791833 HCAPLUS
DN 132:18159
TI Magnetic field sensor
IN Nawrath, Thorsten; Fritzsche, Helmut; Maletta, Hansjoerg; Nowikow, Jan

PA Hahn-Meitner-Institut Berlin G.m.b.H., Germany
SO Ger. Offen., 8 pp.
CODEN: GWXXBX
DT Patent
LA German
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19825392	A1	19991209	DE 1998-19825392	19980528

AB The discovery comprises a magnetic field sensor consisting of a layer sequence of at least two ferromagnetic layers, sepd. from one another by a non-magnetic layer, whereby the ferromagnetic layers serve as ref. layers and the non-magnetic layer is grown so thin that information regarding the magnetization direction of the ferromagnetic layers with respect to one another can be transferred in the form of spin polarized conducting electrons. The goal of the discovery is to construct a magnetic field sensor according to the method described above in such a way that, once commissioned, it has a very long life time and is also able to detect both smaller and larger magnetic fields and furthermore offers the possibility of being e converted into a multi-level sensor. The above goal has been reached with a magnetic field sensor, contg. at least two ferromagnetic layers constructed in such a way that the second ferromagnetic layer (the first serves the customary purpose of acting as a ref.) consists of a layer contg. a multitude of at. monolayers made of antiferromagnetic materials, that this antiferromagnetic layer has a cubic body-centered structure and preferably has an orientation in the (110)-direction,whereby the magnetic moments in the sep. layers are antiferromagnetically arranged and that the antiferromagnetic layer has a such a thickness that an interaction occurs with the neighboring ferromagnetic layer so that the coercivity field strength of the ferromagnetic layer is increased.

L15 ANSWER 20 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:478202 HCAPLUS
DN 131:221887
TI X-ray diffraction and Rutherford backscattering spectrometry of BaNbxTi1-xO3 thin films synthesized by laser ablation
AU Nasir Khan, M.; Kim, Hyun-Tak; Kusawake, T.; Kudo, H.; Ohshima, K.; Uwe, H.
CS Institute of Applied Physics, University of Tsukuba, Tsukuba, Ibaraki, 305, Japan
SO Journal of Applied Physics (1999), 86(4), 2307-2310
CODEN: JAPIAU; ISSN: 0021-8979
PB American Institute of Physics
DT Journal
LA English
AB Niobium-doped barium titanate BaNbxTi1-xO3 thin films have been successfully synthesized by laser ablation on sapphire (0001) and (100) SrTiO3 substrates, for the growth of hexagonal and cubic phases of this system. These films were synthesized with different concns. of niobium under various conditions. X-ray diffraction measurements showed that the **films** were well **aligned** along the c-axis of the sapphire substrate for the hexagonal phase, while **perpendicular** to the SrTiO3 substrate surface for the cubic phase of this system. These films were deposited at substrate temps. of 700 and 650.degree. for the hexagonal and cubic phases, resp., both in oxygen and nitrogen atmospheres. At room temp., these films have a very high resistance and large neg. thermopower .simeq.300 mV/K. RBS spectrometry was performed on very thin films of this system for different concns. of niobium deposited in the N2 atmosphere. The authors have found a deficiency of Ti in these

films by RBS anal., which along with other antisite defects and oxygen deficiency, may be a cause of high resistance and large thermopower in these films.

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 21 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:322588 HCAPLUS
DN 131:12874
TI **Vertical**-type magnetic recording medium with good interlayer lattice matching and its manufacture
IN Norihashi, Hirotaka
PA NEC Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 23 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11134634	A2	19990521	JP 1997-300659	19971031
JP 3052915	B2	20000619		

AB The medium, useful for a computer memory device, comprises successively laminated layers of (A) a (200)-oriented soft magnetic film with bcc structure and (B) a **vertical** magnetic film with hcp (hexagonal closest packing) structure. Optionally, (C) a (200)-oriented **orientation**-controlling **film** with bcc structure may be formed between the substrate and A. The A and B are formed on .gtoreq.200.degree. substrate. In another claimed manuf., A is formed by sputtering at Ar(g) pressure .ltoreq.30 mTorr. The medium showed low noise and good reprodn. property.

L15 ANSWER 22 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:175734 HCAPLUS
DN 130:190563
TI Anodic **aluminum oxide film** patterned for passive **alignment** on semiconductor structures
IN Boudreau, Robert Addison; Bowen, Terry Patrick; Han, Hongtao; Tan, Songsheng; Rowlette, John Robert, Sr.
PA The Whitaker Corporation, USA
SO U.S., 9 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5880525	A	19990309	US 1995-379778	19950127

AB The pattern for passive alignment on a planar substrate (esp. semiconductor chip) is applied by: (a) coating the horizontal surface with Al film; (b) oxidizing the Al film, esp. by electrochem. anodizing; and (c) pattern etching of the **Al2O3** film to form the local sites with microchannels and **vertical**-wall profiles for alignment. The patterned **Al2O3** film is suitable for positioning and passive alignment of optical-glass fibers, optical waveguides, and similar parts attached to the semiconductor substrate for integrated circuits.

RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 23 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:116731 HCAPLUS
DN 130:132077
TI Homeotropically aligned liquid crystal
IN Coates, David; Parri, Owain Llyr; Ward, Jeremy Lewis; Joicey, David; Wilbourn, Keith; Dickson, Colum; Scott, John
PA Merck Patent G.m.b.H., Germany
SO Brit. UK Pat. Appl., 34 pp.
CODEN: BAXXDU
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	GB 2324382	A1	19981021	GB 1998-7947	19980414
	JP 10319408	A2	19981204	JP 1998-117902	19980414
	GB 2358481	A1	20010725	GB 2001-10568	19980414
PRAI	EP 1997-106091	A	19970414		
	GB 1998-7947	A3	19980414		

AB Liq. crystal **films** or **layers** with **homeotropic alignment** are described for which **homeotropic alignment** is achieved by an **aligning layer** on a substrate, the **aligning layer** being either a **layer** comprising a surfactant which is fixed by a matrix of a polymeric liq. crystal or an inorg. layer.

L15 ANSWER 24 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:53509 HCAPLUS
DN 130:203058
TI Lateral epitaxial overgrowth of GaN films on sapphire and silicon substrates
AU Kung, P.; Walker, D.; Hamilton, M.; Diaz, J.; Razeghi, M.
CS Department of Electrical and Computer Engineering, Center for Quantum Devices, Northwestern University, Evanston, IL, 60208, USA
SO Applied Physics Letters (1999), 74(4), 570-572
CODEN: APPLAB; ISSN: 0003-6951
PB American Institute of Physics
DT Journal
LA English
AB The authors report the lateral epitaxial overgrowth of GaN films on (00.1) **Al2O3** and (111) Si substrates by metalorg. CVD. The lateral epitaxial overgrowth on Si substrates was possible after achieving quasimonocryst. GaN template films on (111) Si substrates. X-ray diffraction, photoluminescence, SEM, and at. force microscopy were used to assess the quality of the lateral epitaxial overgrown films. Lateral growth rates more than five times as high as **vertical** growth rates were achieved for both lateral epitaxial overgrowths of GaN on sapphire and Si substrates.
RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 25 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:623180 HCAPLUS
DN 129:283652
TI GaN nucleation mechanism on a surface template of oxidized AlAs
AU Kobayashi, Nobuhiko P.; Kobayashi, Junko T.; Choi, Won-Jin; Dapkus, P. Daniel
CS Compound Semiconductor Laboratory, University of Southern California, Los Angeles, CA, 90089-0241, USA

SO Materials Research Society Symposium Proceedings (1998), 512(Wide-Bandgap Semiconductors for High Power, High Frequency and High Temperature), 47-52
CODEN: MRSPDH; ISSN: 0272-9172
PB Materials Research Society
DT Journal
LA English
AB The surfaces of oxidized AlAs (AlOx) layers on Si(111) substrates were studied to understand the mechanism by which single crystal .alpha.-GaN can be grown by metalorg. CVD (MOCVD) on AlOx that appears to be an amorphous/fine-grain phase. Contact mode at. force microscopy (C-AFM) and RHEED were used to study the AlOx surface on which a GaN nucleation layer (GaN-NL) is grown. An oriented .alpha.-Ga2O3 layer is formed on AlOx which is covered by a GaAs cap layer during oxidn. The authors infer that the .alpha.-Ga2O3 acts as a surface template that provides the order necessary for the subsequent growth of single crystal .alpha.-GaN. Characterization using RHEED and selective area electron diffraction (SAD) in cross sectional transmission microscopy (XTEM) reveals that the in-plane crystallog. orientation has a unique **alignment** between the various **layers** - GaN, .alpha.-Ga2O3 and the Si substrate. This in-plane alignment is understood by considering the at. arrangement of each material on the plane **perpendicular** to [111]Si at each interface. Also a comparison is made between .alpha.-GaN grown on .alpha.-Ga2O3 and on .alpha.-**Al2O3**(0001) to characterize structural defects in .alpha.-GaN. The formation of specific structural defects, a large no. of planar defects run **perpendicular** to [111]Si in .alpha.-GaN/.alpha.-Ga2O3 is discussed in conjunction with GaN-NL on .alpha.-Ga2O3.

L15 ANSWER 26 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:365405 HCAPLUS
DN 128:328992
TI Analysis of preferred **orientations** in PST and PZT thin **films** on various substrates
AU Chateigner, D.; Wenk, H.-R.; Patel, A.; Todd, M.; Barber, D. J.
CS Lab. Cristallographie, CNRS, Grenoble, F-38042, Fr.
SO Integrated Ferroelectrics (1998), 19(1-4), 121-140
CODEN: IFEREU; ISSN: 1058-4587
PB Gordon & Breach Science Publishers
DT Journal
LA English
AB Orientation distributions of PZT and Pb2ScTaO6 (PST) thin films deposited on various substrates and buffer layers are described. All obsd. textures are basically fiber textures. Only PST films deposited on MgO/(11.hivin.20)-**Al2O3** show a weak in-plane alignment, with .ltbbrac.100.rtbbrac. PST **perpendicular** to the film surface. PST films deposited on a Pt/(100)-Si substrate exhibit a strong .ltbbrac.111.rtbbrac. fiber texture, tilted 5.degree. to the normal. The Pt substrate has also a .ltbbrac.111.rtbbrac. fiber texture, with orientation densities as high as 60 times the random distribution (m.r.d.). On both substrates, PST **films** show maxima in the **orientation** distribution near 35 m.r.d. PZT films (PZT/Pt/Si-(100) and PZT/Pt/Ti/SiO2/Si-(100)) have a .ltbbrac.111.rtbbrac. fiber texture. The max. orientation distribution obsd. for PZT is 200 m.r.d. A minor .ltbbrac.100.rtbbrac. fiber component may be present. The Pt textures resemble qual. those of PZT, mainly .ltbbrac.111.rtbbrac.. The addn. of a Ti buffer layer on grown SiO2 favors the stabilization of PZT in a tetragonal crystal system, and increases strongly the Pt texture, and to a lesser degree that of PZT.

L15 ANSWER 27 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1998:226768 HCAPLUS
DN 128:289282
TI **Perpendicular** magnetic recording medium and apparatus
IN Nakamura, Atsushi; Futamoto, Masaaki; Hirayama, Yoshiyuki; Suzuki, Mikio; Honda, Yukio; Takayama, Takanobu
PA Hitachi, Ltd., Japan
SO U.S., 13 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5738927	A	19980414	US 1995-459794	19950602
PRAI JP 1994-126081		19940608		

AB A film with **perpendicular** magnetic anisotropy and a protective film are formed over a single-crystal substrate. This substrate is made of either a single crystal having a hexagonal crystal structure and a (0001) plane parallel to the substrate plane or a single crystal having a cubic crystal structure and a (111) plane parallel to the substrate plane, and the film is epitaxially grown such that its easy axis of magnetization is **perpendicular** to the substrate plane. As a result, the **film** can have its **perpendicular orientation** and **perpendicular** magnetic anisotropy improved to effect a **perpendicular** magnetic recording of high d. to provide the **perpendicular** magnetic recording medium.

L15 ANSWER 28 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:552257 HCAPLUS
DN 127:270842
TI The physical properties of Al-doped zinc oxide films prepared by RF magnetron sputtering
AU Park, Ki Cheol; Ma, Dae Young; Kim, Kun Ho
CS Department of Electronic Materials Engineering and Research Center for Aircraft Parts Technology, Gyeongsang National University, Jinju, 660-701, S. Korea
SO Thin Solid Films (1997), 305(1,2), 201-209
CODEN: THSFAP; ISSN: 0040-6090
PB Elsevier
DT Journal
LA English
AB Al-doped zinc oxide (AZO) films were prepd. by RF magnetron sputtering on glass and Si substrates with specifically designed ZnO targets contg. different amts. of **Al2O3** powder as a doping source. The phys. properties of the AZO films were studied in terms of the prepn. conditions, such as **Al2O3** content in the target, RF power (PRF), substrate temp. (Ts) and working pressure (Pw). The crystal structure of the AZO film is hexagonal wurtzite, and all the **films** show the typical crystallog. **orientation**, with the c-axis **perpendicular** to the substrate. The growth rate increases with increasing PRF, but decreases with increasing Ts and Pw. Films 1500 .ANG. thick with the lowest resistivity (.rho.) of 4.7 .times. 10-4 .OMEGA. cm and the transmittance over 90% at the visible region were prepd. by using nominal 3% **Al2O3** target at Ts = 150.degree., Pw = 2 mtorr and PRF = 150 W. Optical transmittance measurements show that AZO films are degenerate semiconductors with direct bandgap. The optical energy bandgap for undoped ZnO film is .apprx.3.3 eV and those for AZO films increase as the carrier concn. (ne) in the film increases. The blue shift in the AZO

films is proportional to 1/3 power of ne.

L15 ANSWER 29 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:523049 HCAPLUS
DN 127:255183
TI Submicron contact lithography for etching and lift-off applications using an i-line negative tone photoresist with controllable slope
AU Huang, Howard; Lea, Dallas; Lichtenberger, Arthur
CS Department Electrical Engineering, University Virginia, Charlottesville, VA, 22903, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (1997), 3049(Advances in Resist Technology and Processing XIV), 720-727
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
AB We have used an i-line neg. tone photoresist to define submicron masking features with contact lithog. for applications in plasma etching, wet chem. processing, and lift-off. The resist used for our study is the Futurrex NR8 series. It is based on a polyhydroxystyrene resin structure rather than the polyisoprene matrix resin found in most conventional neg. resists, and it uses an aq. alk. soln. instead of an org. solvent for development. We have found this resist to be very thermally stable at relatively high temps., and is compatible with various plasma and wet chem. processes. Moreover, through proper selection of lithog. parameters, the resist profile can be tailored to accurately obtain pos., **vertical** or neg. sloped side-walls for specific applications. We have established lift-off processes of numerous kinds of evapd. and sputtered metals and oxides using the unique profile-controlling property of this resist. We present SEM images and data from a study of the effects of lithog. parameters on resist profiles. Also included is the fabrication sequence of a submicron single **layer** self-**aligned** lift-off process using the NR8 resist. These results suggest potential applications in a wide variety of processes.

L15 ANSWER 30 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:506771 HCAPLUS
DN 127:241702
TI Preparation of piezoelectric-coefficient modulated multilayer film ZnO/**Al2O3** and its ultrahigh frequency resonance
AU Hu, W. S.; Liu, Z. G.; Wu, R. X.; Chen, Y.-F.; Ji, W.; Yu, T.; Feng, D.
CS Natl. Lab. Solid State Microstructures, Nanjing Univ., Nanjing, 210093, Peop. Rep. China
SO Applied Physics Letters (1997), 71(4), 548-550
CODEN: APPLAB; ISSN: 0003-6951
PB American Institute of Physics
DT Journal
LA English
AB Multilayer films composed of piezoelec. active ZnO and inactive **Al2O3** layers were prepd. on Si by a pulsed laser deposition technique. The ZnO layers were completely textured to generate a single piezoelec. coeff. d33 **perpendicular** to the substrate surface, and the **Al2O3** layers were amorphous at 375.degree.. The interfacial sharpness and the **film orientation** were analyzed by low- and high-angle x-ray diffraction .theta.-2.theta. scanning. High-frequency resonance of 10.6 GHz was measured and higher values up to 100 GHz are expected in the multilayer films with periods .ltoreq.320 nm.

L15 ANSWER 31 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:438500 HCAPLUS
DN 127:155618
TI Deposition of BaFe12O19 thin films by a new injection-CVD method
AU Pignard, S.; Senateur, J.P.; Vincent, H.; Kreisel, J.; Abrutis, A.
CS L.M.G.P., UMR 5628 du CNRS, E.N.S. de Physique de Grenoble, Saint-Martin d'Heres, 38402, Fr.
SO Journal de Physique IV (1997), 7(C1, 7th International Conference on Ferrites, 1996), C1/483-C1/484
CODEN: JPICEI; ISSN: 1155-4339
PB Editions de Physique
DT Journal
LA English
AB A new process of injection-MOCVD was used to synthesize Ba hexaferrite thin films on **Al2O3** (0001) substrates. This new technique uses a liq. source of precursors dissolved in a convenient solvent. X-ray diffraction measurements were performed to observe thin **films** lattices with respect to the **orientation** of the substrate: hexaferrite **film** epitaxy is obsd. with c-axis **perpendicular** to the substrate. Magnetic measurements were performed in the plane and **perpendicular** to the film plane and they confirm the preferential **orientation** of **films**.

L15 ANSWER 32 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:314515 HCAPLUS
DN 127:86605
TI Simulations of hydrocarbon adsorption and subsequent water penetration on an **aluminum oxide** surface
AU De Sainte Claire, P.; Hass, K. C.; Schneider, W. F.; Hase, W. L.
CS Ford Research Laboratory, SRL MD-3028, Dearborn, MI, 48121-2053, USA
SO Journal of Chemical Physics (1997), 106(17), 7331-7342
CODEN: JCPSA6; ISSN: 0021-9606
PB American Institute of Physics
DT Journal
LA English
AB Static and dynamic equil. properties of butane, octane, and dodecane films adsorbed on .alpha.-**Al2O3**(0001) at a variety of coverages and temps., and the subsequent penetration of such films by 30 mol. water clusters are examd. using classical mol. dynamics. Model potential functions are constructed from existing alkane united atom and "simple point charge" model water parameters, exptl. alkane desorption energies and other available theor. information. The adsorbed films exhibit a distinct layering parallel to the surface, and a pronounced densification, redn. in gauche defects and **orientational** ordering within the innermost **layer**. Strong surface corrugation allows mols. to rotate relatively freely about their long axes at intermediate temps. and assists them in orienting their zig-zag planes **perpendicular** to the surface at lower temps. Only butane mols. show any tendency to tilt their long axes out of the first layer toward the second. (H2O)30 clusters are attracted toward the alumina surface and easily penetrate most of the adsorbed alkane films, either by displacing alkane mols. to more distant layers or causing them to pack more closely within existing layers. The mols. in the clusters tend to remain connected during penetration. Kinetic barriers to penetration become increasingly significant for higher alkane coverages, lower temps., and longer chains.

L15 ANSWER 33 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:302307 HCAPLUS
DN 126:350384

TI Reactive pulsed laser deposition - a tool for obtaining high-quality piezoelectric thin films
AU Dinescu, M.; Verardi, P.; Craciun, F.
CS Laser Department, Institute of Atomic Physics, Bucharest, Rom.
SO Proceedings of SPIE-The International Society for Optical Engineering (1997), 3093(Nonresonant Laser-Matter Interaction (NLMI-9)), 249-255
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
AB High-quality ZnO, AlN, PZT thin films were deposited on different substrates (Si, sapphire, Corning glass) by the reactive pulsed laser deposition technique using a Nd-YAG laser (.lambda. = 1.06 .mu.m, tFWHM = 10 ns, 0.3 J/pulse) as laser source. The deposition were performed in a stainless steel vacuum chamber (base pressure less than 10-6 mbar) as follows: (1) Zn and PZT targets in a high-purity oxygen atm., (2) Al target in ultrahigh-purity nitrogen reactive atm. Low collector temps. (in the range of 0-350.degree.), high distance target collector (4-7 cm), high laser intensities, reactive gas pressure in the range of 10-3-10-1 mbar were found to be mandatory requirements for obtaining uniform, appropriate cryst. **orientation** thin **films**, with thickness in the range of 2-4 .mu.m. Typical anal. as: x-ray diffraction, cross-section SEM, XPS, FTIR spectroscopy, SIMS spectroscopy, and optical absorption spectroscopy were used to characterize the deposited films. They evidenced the stoichiometric compn., cryst. structure with the c-axis **perpendicular** to substrate surface, columnar structure, etc. For the piezoelec. properties studies a special structures were prepd.: substrate (Si, etc.)/Cr(100 .ANG.)/Au(1000 .ANG.)/ZnO(or AlN, or PZT)/Al in order to configure an electroacoustic transducer for bulk acoustic wave generation and detection. The measurements confirm the good properties of the deposited films.

L15 ANSWER 34 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:291040 HCAPLUS
DN 127:58584
TI Extraordinary Hall effect in (111) and (100)-orientated Co/Pt superlattices
AU Canedy, C. L.; Li, X. W.; Xiao, Gang
CS Physics Dep., Brown Univ., Providence, RI, 02912, USA
SO Journal of Applied Physics (1997), 81(8, Pt. 2B), 5367-5369
CODEN: JAPIAU; ISSN: 0021-8979
PB American Institute of Physics
DT Journal
LA English
AB We have fabricated a series of (111)- and (100)-orientated Co/Pt superlattices of high quality. The (111)-orientated superlattices acquire a **perpendicular** magnetic anisotropy for samples with thin Co **layers** whereas for the (100)-**orientated** superlattices the easy magnetization direction remains in plane. Anal. of the extraordinary Hall effect (EHE) verifies the applicability of simple scaling laws between the resistivity and the EHE coeff. for these layered materials. In addn., we have found a marked dependence of the skew coeff. on Co layer thickness. The contribution to EHE from quantum side-jump remains relatively const.

L15 ANSWER 35 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1997:1920 HCAPLUS
DN 126:41410
TI Perovskite-type oxide ferroelectric thin film

IN Abe, Takayuki
PA Sumitomo Metal Mining Co, Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 08253324	A2	19961001	JP 1995-79535	19950310

AB The film comprises a substrate successively coated with a Bi-base layered perovskite-type oxide thin film, whose c-axis is **perpendicular** to the substrate and an ABO3 (A = Bi, Pb, Ba, Sr, Ca, Na, K, and/or rare earth metals; B = Ti, Nb, Ta, W, Mo, Fe, Co, Cr, and/or Zr) perovskite-type ferroelec. thin film. The film is useful for IR detectors, actuators, etc. The **film** showed good c-axis **orientation**.

L15 ANSWER 36 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:728519 HCAPLUS
DN 126:97127
TI Growth of III-V nitride films for optoelectronic devices
AU Knick, D. C.; Tomar, M. S.; Kuenhold, K. A.
CS Phys./Engineering Phys. Dep., Univ. Tulsa, Tulsa, OK, 74104, USA
SO Materials Science Forum (1996), 223-224, 237-240
CODEN: MSFOEP; ISSN: 0255-5476
PB Trans Tech
DT Journal
LA English
AB A low-pressure metalorg. VPE process was developed for GaN using a modified in situ mixing in a **vertical** reactor. GaEt3 and NH3 were used as sources of Ga and N, resp. GaN films were grown on GaAs, alumina, and Si substrates at 600-700.degree. and a system pressure of torr. Films were characterized by ellipsometry, XRD, Raman spectroscopy, SEM, and Hall measurements. As-grown **films** were stoichiometric with hexagonal **orientation** having a lattice const. of 4.53 .ANG., and showed n-type behavior with room temp. carrier concn. n = 8 .times. 1016 /cm3.

L15 ANSWER 37 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:582878 HCAPLUS
DN 125:261562
TI Heteroepitaxial growth of TiO2 films by ion-beam sputter deposition
AU Morris Hotsenpiller, P. A.; Wilson, G. A.; Roshko, A.; Rothman, J. B.; Rohrer, G. S.
CS DuPont Company, Experimental Station, Wilmington, DE, 19880-0356, USA
SO Journal of Crystal Growth (1996), 166(1-4), 779-785
CODEN: JCRGAE; ISSN: 0022-0248
PB Elsevier
DT Journal
LA English
AB Heteroepitaxial TiO2 films of the rutile and anatase phases were grown using the ion-beam sputter deposition technique. The **orientations** of the highest-quality rutile **films** grown and their corresponding substrates are (100)/(0001)**Al2O3**, (101)/(11.hivin.20)**Al2O3**, (001)/(10.hivin.10)**Al2O3**, and (110)/(110)MgO. This is the 1st report of the heteroepitaxial growth of (001)/(10.hivin.10)**Al2O3** and (110)/(110)MgO rutile films. The **films** are **aligned** both **perpendicular** and

parallel to the plane of the film. Distinct surface morphologies are obsd. for each orientation. The (100) and (101) rutile orientations were also grown on (111)MgO and (1.hivin.102)**Al2O3**, resp. The (100) anatase grew on both (100)MgO and MgAl2O4. The growth mechanisms of several rutile films on **Al2O3** substrates were studied, and the data suggest island or Volmer-Weber type growth.

L15 ANSWER 38 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:565828 HCAPLUS
DN 125:262568
TI Epitaxial MgO buffer layers for YBCO thin films on R-plane **Al2O3**
AU Hakuraku, Y.; Maezono, K.; Ueda, H.
CS Faculty Eng., Kagoshima Univ., Kagoshima, 890, Japan
SO Superconductor Science & Technology (1996), 9(9), 775-778
CODEN: SUSTEF; ISSN: 0953-2048
PB Institute of Physics Publishing
DT Journal
LA English
AB MgO buffer layers were epitaxially grown on R-plane **Al2O3** (1102) substrates by rf magnetron sputtering using an Mg metal target for high-Tc superconducting thin films. A c-axis oriented MgO film with a smooth and homogeneous surface was obtained at 350 .degree.C in an Ar/O2 mixt. under a total sputtering gas pressure of 0.3 Torr with 4 .times. 10-6 Torr O2. High-Tc superconducting Y1Ba2Cu3O7-x (YBCO) thin films were prepd. on **Al2O3** substrates with an without an MgO buffer layer by dc magnetron sputtering. The YBCO film on **Al2O3** with an MgO buffer **layer** was c-axis **orientated perpendicular** to the surface and exhibited zero resistivity at Tc = 80 K. A depth profile of at. concn. and interdiffusion for YBCO (3000 .ANG.)/MgO (500 .ANG.)/ **Al2O3** was investigated. No diffusion of any atom was obsd. in the interfaces.

L15 ANSWER 39 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:461481 HCAPLUS
DN 125:119113
TI Molecular mechanics study of the interaction of molybdenum disulfide layers with a .gamma.-alumina support in hydrotreating catalysts
AU Faye, Philippe; Payen, Edmond; Bougeard, Daniel
CS Laboratoire de Catalyse Heterogene et Homogene, Universites des Sciences et Technologies de Lille, F-59655, Fr.
SO Journal of the Chemical Society, Faraday Transactions (1996), 92(13), 2437-2443
CODEN: JCFTEV; ISSN: 0956-5000
PB Royal Society of Chemistry
DT Journal
LA English
AB The non-bonded interactions of MoS2 slabs supported on .gamma.-**Al2O3**, which are the active phase of a hydrotreatment catalyst, have been modeled by mol. mechanics. Free MoS2 sheets, contg. 39 molybdenum atoms, have been used to test the reliability of the force field. The edge MoS2 planes and the support surfaces have been ideally modeled in order to investigate the influence on energy of geometrical parameters such as the **orientation** of the MoS2 **layered** cluster on .gamma.-**Al2O3** or the distance between the support and the MoS2 slabs. Whatever the support surface, a single MoS2 slab lying flat on the support is more stable than a slab **perpendicular** to the support, however, the energy difference between these two configurations decreases as the no. of stacked MoS2 sheets increases. The energy of the interactions between two contiguous layers or between a

sheet and the exposed surface of the support shows that single sheets lying flat are favored on the [111] plane whereas the [110] plane induces a stacking of several slabs. The intercalation of one layer between a slab and the support or between two contiguous MoS2 slabs leads to a screen effect, characterized by a decrease of about two orders of magnitude in the interaction energy of the sepd. surfaces. This effect increases with the no. of inserted sheets.

L15 ANSWER 40 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:394033 HCAPLUS
DN 125:45298
TI Reflective liquid crystal display and its manufacture
IN Shimada, Yasunori; Mitsui, Seiichi
PA Sharp Kk, Japan
SO Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08101383	A2	19960416	JP 1994-239216	19941003
	JP 3097945	B2	20001010		
	US 5805252	A	19980908	US 1995-535952	19950928
	US 6097459	A	20000801	US 1998-104121	19980624
PRAI	JP 1994-239216	A	19941003		
	US 1995-535952	A3	19950929		

AB The title display has an Al or Al-based metal reflective electrode on 1 substrate, an ITO opposite electrode on another substrate, a surface oxidn. film of thickness 5-10 nm on the reflective electrode, and an insulative **vertical orientation film** on the surface oxidn. **film**.

L15 ANSWER 41 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:335936 HCAPLUS
DN 126:125857
TI Crystallographic and magnetic investigations of the cobalt columns electrodeposited in the pores of anodic alumina
AU Khan, H. R.; Loebich, O.; Rauscher, G.
CS Forschungsinstitut fuer Edelmetalle und Metallchemie, Katharinenstrasse 17, Schwabisch Gmund, 73525, Germany
SO Thin Solid Films (1996), 275(1-2), 207-209
CODEN: THSFAP; ISSN: 0040-6090
PB Elsevier
DT Journal
LA English
AB Textured polycryst. cobalt columns are electrochem. deposited in the pores of anodic alumina layers of 15 .mu.m thickness. X-ray diffraction studies show that the cobalt columns are polycryst. and textured. The crystallite size of the cobalt columns is .apprx.80 nm and the c axis is oriented at an angle of .apprx.60.degree. towards the layer surface. The layers show **perpendicular** magnetization anisotropy. Anomalies in the magnetization parameters such as satn. magnetization, coercivity and the area of the magnetization hysteresis loop around an angle of 40.degree. are also obsd. Max. coercivity of 1.40 kOe and a Mr/Ms ratio of 0.714 are obsd. for the mech. polished AlMg1 substrate before anodic oxidn. The crystallog. and magnetic data further suggest a possibility that **perpendicular** magnetic anisotropy of the layers is caused by the cobalt columns **perpendicular** to the **layer** surface

rather than c-axis **orientation** of polycryst. cobalt columns.

L15 ANSWER 42 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:240410 HCAPLUS
DN 124:299821
TI Systematic study of orientational wetting and anchoring at a liquid-crystal-surfactant interface
AU Crawford, G. P.; Ondris-Crawford, R. J.; Doane, J. W.; Zumer, S.
CS Liquid Crystal Inst., Kent State Univ., Kent, OH, 44242-0001, USA
SO Phys. Rev. E: Stat. Phys., Plasmas, Fluids, Relat. Interdiscip. Top. (1996), 53(4-B), 3647-61
CODEN: PLEEE8; ISSN: 1063-651X
DT Journal
LA English
AB The mol. anchoring and orientational wetting properties of a liq. crystal close to the nematic-isotropic transition temp. confined to the 0.2 .mu.m cylindrical channels of **Al2O3** membranes were studied for various surface prepns. The cavity walls of the confining pores were modified chem. with an aliph. acid (CnH2n+1-COOH) to establish surface anchoring. Radical changes in D NMR (2H-NMR) line shapes in the nematic phase reveal the existence of a discontinuous **homeotropic**-to-planar anchoring transition that is induced by either changing the length of the surfactant (vary carbon no. n), the d. of the surfactant on the surface (vary concn.), or by varying temp. The transition to planar anchoring drives the planar-polar nematic director field to a stable uniform axial structure. Above the nematic-isotropic transition temp., the thickness of the surfactant monolayer strongly influences the degree of surface-induced orientational ordering. The corresponding order parameter of the liq.-crystal mols. at the surfactant interface increases as n increases. An orientational wetting transition from partial to quasicomplete is obsd. as the length of the aliph. acid increases. The effect is manifested in the change of the pretransitional temp. dependence of the adsorption parameter from weak to strong (but still nondivergent). Further increase in n results in a reentrant phenomenon back to the partial wetting regime. Similar coupling mechanisms and wetting behaviors exhibited by the long chain aliph. acids and the more rigid benzoic acid surfactants indicate minimal interdigitation of the liq.-crystal mols. into the surfactant **aligning layer**.

L15 ANSWER 43 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1996:90022 HCAPLUS
DN 124:192014
TI Substrate temperature and oxygen pressure dependence of pulsed laser-deposited Sr ferrite films
AU Papakonstantinou, P.; O'Neill, M.; Atkinson, R.; Salter, I. W.; Gerber, R.
CS Department of Pure and Applied Physics, The Queen's University of Belfast, Belfast BT7 1NN, Northern Ireland, UK
SO J. Magn. Magn. Mater. (1996), 152(3), 401-10
CODEN: JMMMDC; ISSN: 0304-8853
DT Journal
LA English
AB The effect of substrate temp. and oxygen pressure on the microstructure and magnetic and magneto-optical properties of Sr ferrite (SrM) films grown on (001) single-crystal sapphire substrates by pulsed laser deposition has been investigated. Polycryst. SrM films with **perpendicular** magnetic anisotropy could be prepd. under a wide range of oxygen pressures and relatively high temps., sufficient to crystallize the material. However, an almost exclusive c-axis **orientation** normal to the **film** plane could be attained

only at a narrow operational window centered at 0.1 mbar and 840.degree.. The magneto-optical properties of the films are comparable to those of bulk barium hexaferrite single-crystal material. In addn., results obtained by at. force microscopy provide convincing evidence that the growth of Sr ferrite on sapphire takes place by a spiral growth mechanism.

L15 ANSWER 44 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:902693 HCAPLUS
DN 123:294532
TI Ceramic-coated parts with good surface smoothness
IN Mikami, Kazuhiko; Aida, Hiroshi
PA Kyocera Corp, Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 07180057	A2	19950718	JP 1993-324170	19931222
	JP 3220315	B2	20011022		
	JP 2002080966	A2	20020322	JP 2001-191961	19931222
	JP 2002098818	A2	20020405	JP 2001-191960	19931222
PRAI	JP 1993-324170	A3	19931222		

AB The title ceramic coatings having polished surface roughness .ltoreq.100 .ANG. consist of oriented crystal grains whose crystal growth direction has max. tilting angle .ltoreq.30 degree with respect to the direction **perpendicular** to the substrate surface. Preferably, the ceramic coating is SiC, AlN, **Al2O3**, and/or TiB2.

L15 ANSWER 45 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:831429 HCAPLUS
DN 123:235705
TI Structural characterization of AlN thin film by symmetric Bragg diffraction and grazing incidence X-ray diffraction
AU Kim, Ki Hong; Chang, Chang Hwan; Koo, Yang Mo
CS Dep. Materials Sci. Eng., Pohang Univ. Sci. Technology, Pohang, 790-330, Japan
SO Taehan Kumsok Hakhoechi (1995), 33(5), 572-7
CODEN: TKHCDJ; ISSN: 0253-3847
DT Journal
LA Korean
AB The structure of AlN thin film deposited on an **Al2O3**(0001) substrate is examd. using sym. Bragg diffraction and Grazing Incidence X-ray Diffraction (GID) methods. A new five-circle goniometer is adapted to carry out the GID expts. for convenience and accuracy. This goniometer consists of a conventional four-circle goniometer and a new circle segment inserted between the 0-20 circles and the Eulerian cradle of the four-circle goniometer. It is found that the **orientational** relationship between AlN thin **film** and **Al2O3** substrate is AlN[10.hivin.10] || **Al2O3**[11.hivin.20] and AlN(0002) || **Al2O3**(0006). The strain parallel to the interface is 1.0% and that **perpendicular** to the interface is 1.1%. The thin film is composed of small sized mosaic blocks. The size and orientational spread of the mosaic crystallites is 98 .ANG. and 2.4.degree. parallel direction to the interface, and 74 .ANG. and 2.7.degree. **perpendicular** direction to it.

L15 ANSWER 46 OF 80 HCAPLUS COPYRIGHT 2002 ACS

AN 1995:695278 HCAPLUS
DN 123:90805
TI Epitaxial aluminum-doped zinc oxide thin films on sapphire: I, effect of substrate orientation
AU Srikant, V.; Sergo, Valter; Clarke, David R.
CS Mater. Dep., Univ. California, Santa Barbara, CA, 93106-5050, USA
SO J. Am. Ceram. Soc. (1995), 78(7), 1931-4
CODEN: JACTAW; ISSN: 0002-7820
DT Journal
LA English
AB Epitaxial thin films of Al-doped zinc oxide have been grown on sapphire substrates by pulsed laser ablation. The effect of substrate temp., background pressure of oxygen, and substrate orientation (A, M, R, C) on the orientation relationships between ZnO and sapphire have been evaluated using on- and off-axis X-ray diffractometry. Under all growth conditions zinc oxide, on A- and C-plane sapphire, grew with the c-axis **perpendicular** to the substrate. In contrast, on M and R orientations of sapphire, ZnO grew with its c-axis parallel or **perpendicular** to the substrate depending on the substrate temp. and background pressure employed during growth. In all cases only one unique in-plane relationship between the sapphire substrate and the zinc oxide film was found with the exception of the M-plane at high substrate temps.

L15 ANSWER 47 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:640104 HCAPLUS
DN 123:183807
TI Growth of SrTiO3 thin epitaxial films by aerosol MOCVD
AU Froehlich, K.; Machajdik, D.; Rosova, A.; Vavra, I.; Weiss, F.; Bochu, B.; Senateur, J. P.
CS Institute Electrical Eng., SAS, Bratislava, Slovakia
SO Thin Solid Films (1995), 260(2), 187-91
CODEN: THSFAP; ISSN: 0040-6090
DT Journal
LA English
AB SrTiO3 thin films were prepd. by aerosol metalorg. CVD on (001) MgO, R-plane **Al2O3** and (001) Si single-crystal substrates. Sr tetra-methylheptadionate and Ti n-butoxide dissolved in diethyleneglycol di-Me ether were used as precursors. The structure of the films was studied by x-ray diffraction and TEM. Epitaxial **films** with [001] and [111] **orientation perpendicular** to the substrate surface were obtained on MgO and **Al2O3**, resp. The epitaxial films on the MgO substrate are in a relaxed state with lattice parameters corresponding to the bulk values. SrTiO3 films on the Si substrate were grown as highly texture in the [011] direction and randomly oriented in the plane parallel to the substrate surface.

L15 ANSWER 48 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:253217 HCAPLUS
DN 122:121312
TI FMR study of MBE-grown Co films on **Al2O3** and MgO substrates
AU Goryunov, Yu. V.; Khusainov, M. G.; Garifullin, I. A.; Schreiber, F.; Pelzl, J.; Zeidler, Th.; Broehl, K.; Metoki, N.; Zabel, H.
CS Kazan Physicotechnical Institute of Russian Academy of Sciences, Kazan, 420029, Russia
SO Journal of Magnetism and Magnetic Materials (1994), 138(1-2), 216-21
CODEN: JMMMDC; ISSN: 0304-8853
PB Elsevier
DT Journal

LA English
AB FMR studies of epitaxial Co(0001) films on **Al2O3**(11.hivin.20) and Co(11.hivin.20) on MgO(001) substrates were performed at the X-band and in the temp. range 80-400 K For the samples on sapphire substrates the resonance field behavior as a function of the d.c. magnetic field **orientation** in the plane of the **film** exhibits a uniaxial anisotropy. But for the Co films on MgO substrates a 4-fold anisotropy in the film plane was obsd. Both in-plane anisotropies are unexpected with regard to the Co film structure. The FMR anal. shows that the 4-fold anisotropy for Co/MgO occurs due to a twinned film structure consisting of two Co domains with their c-axes in the film plane and **perpendicular** to each other.

L15 ANSWER 49 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1995:222458 HCAPLUS
DN 122:62016
TI Crystallization of textured PbTiO3 films deposited from gels
AU Guzman, Guillermo; Barboux, Philippe; Livage, Jacques; Perriere, Jacques
CS Universite Pierre et Marie Curie, Paris, 75252, Fr.
SO Journal of Sol-Gel Science and Technology (1994), 2(1/2/3), 619-22
CODEN: JSGTEC; ISSN: 0928-0707
PB Kluwer
DT Journal
LA English
AB Sol-gel processed PbTiO3 thin films have been deposited by spin coating onto different substrates; Si[111], Si/Al, Si/SiO2/Cr/Pt, MgO[100], SrTiO3[100] and sapphire. Interactions between the substrate and PbTiO3 films after heat treatment have been studied by X-ray diffraction and Rutherford Back Scattering. When deposited onto sapphire and Si[111], PbTiO3 **films** exhibit a preferred **orientation** with (101) **perpendicular** to the substrate. These films become oriented along (100) onto MgO and (001) onto SrTiO3[100] substrates. A strong channelling effect is obsd. by the RBS technique when the film is oriented along the c axis on SrTiO3[100] suggesting that these films are epitaxially grown. The diffusion of metal atoms during the thermal treatment gives rise to the formation of lead silicate on Si[111] substrates. As a result a pyrochlore phase is formed. Lead titanate films on Si/SiO2/Cr/Pt and Si/Al substrates are polycryst. and do not exhibit any texture.

L15 ANSWER 50 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1994:446900 HCAPLUS
DN 121:46900
TI Characterization of gallium nitride grown on (0001) sapphire by plasma-enhanced atomic layer epitaxy
AU Hwang, C.-Y.; Lu, P.; Mayo, W. E.; Lu, Y.; Liu, H.
CS Dep. Mech. Mater. Sci., Rutgers Univ., Piscataway, NJ, 08855, USA
SO Mater. Res. Soc. Symp. Proc. (1994), 326(Growth, Processing, and Characterization of Semiconductor Heterostructures), 347-52
CODEN: MRSPDH; ISSN: 0272-9172
DT Journal
LA English
AB .alpha.-GaN thin films were grown on (0001) sapphire by a plasma-enhanced at. layer epitaxy (PEALE) technique using a GaN buffer layer grown at lower temps. Both single crystal and polycrystal thin films were obtained depending on the growth conditions, particularly, O contamination of the plasma source and the substrate temp. The **orientation** relation between the single crystal **film** and the substrate is [0001]GaN//[0001]**Al2O3**, [1.hivin.100]GaN//[1.hivin.210]

Al2O3 and [2.hivin.1.hivin.10]GaN//[1.hivin.100]**Al2O3**. The polycryst. film has the c-axis **perpendicular** to the substrate and contains the same **orientation** found in the single crystal **film**. However, 2 addnl. orientations were found that are rotated approx. .+-.19.degree. from the single crystal orientation. The defect structures at the film/substrate interface were studied by various x-ray methods such as rocking curves and phi scans, along with plane-view and cross sectional TEM. Possible growth mechanisms of both the single crystal and polycryst. films are discussed.

L15 ANSWER 51 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1994:117840 HCAPLUS
DN 120:117840
TI **Orientation** and mobility in ultrathin oligothiophene **films**: UV-Vis, IR and fluorescence studies
AU Egelhaaf, H.-J.; Baeuerle, P.; Rauer, K.; Hoffmann, V.; Oelkrug, D.
CS Institute of Physical and Theoretical Chemistry, University of Tuebingen, Tubingen, Germany
SO Synth. Met. (1993), 61(1-2), 143-6
CODEN: SYMEDZ; ISSN: 0379-6779
DT Journal
LA English
AB Thin films of oligothiophenes (.alpha.nT) are prepd. by vapor deposition on fused silica and cryst. sapphire substrates, and characterized with respect to mol. orientation by polarized fluorescence, UV-visible, and IR absorption spectroscopy. Isolated .alpha.nT are adsorbed in the submonolayer region with their long mol. axes parallel to the surface plane. In the monolayer region, the .alpha.nT organize with their long axes **perpendicular** to the surface plane forming aggregates of the pin cushion type with a mean tilt angle of .theta. = 15 .+-. 3.degree. relative to the normal of the macroscopic surface. Terminal alkylation of .alpha.nT or multilayer coverage results in a loss of orientation with respect to the surface. Heating the substrate during film deposition either reduces or enhances the mol. order depending on temp. and mol. chain length.

L15 ANSWER 52 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1993:202364 HCAPLUS
DN 118:202364
TI Raman scattering and x-ray diffractometry studies of epitaxial titanium dioxide and vanadium dioxide thin films and multilayers on .alpha.-alumina (11.hivin.20)
AU Foster, C. M.; Chiarello, R. P.; Chang, H. L. M.; You, H.; Zhang, T. J.; Frase, H.; Parker, J. C.; Lam, D. J.
CS Mater. Sci. Div., Argonne Natl. Lab., Argonne, IL, 60439, USA
SO J. Appl. Phys. (1993), 73(6), 2841-7
CODEN: JAPIAU; ISSN: 0021-8979
DT Journal
LA English
AB Epitaxial thin films of TiO2 and VO2 single layers and TiO2/VO2 multilayers were grown on (11.hivin.20) sapphire (.alpha.-**Al2O3**) substrates using the metalorg. CVD technique and were characterized using Raman scattering and 4-circle x-ray diffractometry. X-ray diffraction results indicate that the films are high quality single crystal material with well defined growth plane and small in-plane and out-of-plane mosaic. Single-layer films obey the Raman selection rules of TiO2 and VO2 single crystals. The close adherence to the Raman selection rules indicates the high degree of **orientation** of the **films**, both parallel and **perpendicular** to the growth plane. Selection rule spectra

of 2 and 3 layer TiO2/VO2 multilayers are dominated by the VO2 layers with only minimal signature of the TiO2 layers. Due to the low band gap of semiconducting V dioxide, the authors attribute the strong signature of the VO2 layers to resonant enhancement of the VO2 Raman component accompanied with absorption of the both the incident and scattered laser light from the TiO2 layers.

L15 ANSWER 53 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1992:581956 HCAPLUS
DN 117:181956
TI Liquid-crystal display device containing transparent insulative films
IN Yoshihara, Toshiaki; Mochizuki, Akihiro
PA Fujitsu Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 04043329	A2	19920213	JP 1990-152219	19900611

AB The title device is made by placing face to face 2 transparent substrates in which a transparent electrode and a transparent insulative film having a high dielec. const. and **perpendicular** orientation inductiveness are laminated in order on each of the 2 substrates, so that a gap having a prescribed sepn. is formed between the insulative films, bonding and sealing the peripheral area of the 2 substrates, injecting phase-transition-type liq. crystals in the gap between the 2 substrates, and sealing the device.

L15 ANSWER 54 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1992:31813 HCAPLUS
DN 116:31813
TI Preparation and structural characterization of sputtered cobalt(II) oxide, nickel(II) oxide, and nickel (Ni0.5Co0.5O) thin epitaxial films
AU Carey, M. J.Spada, F. E.; Berkowitz, A. E.; Cao, W.; Thomas, G.
CS Cent. Magn. Rec. Res. 0401, Univ. California, San Diego, La Jolla, CA, 92093-0401, USA
SO J. Mater. Res. (1991), 6(12), 2680-7
CODEN: JMREEE; ISSN: 0884-2914
DT Journal
LA English
AB Single-phase CoO, NiO, and Ni0.5Co0.5O epitaxial films were prepd. by reactive sputtering onto .ltbbrac.0001.rtbbrac. .alpha.-**Al2O3** substrates maintained at 373 K. Epitaxy was confirmed by x-ray diffraction (XRD) and high resoln. electron microscopy (HREM) techniques. These monoxide films are cubic and contain rotation twins with the twin axis parallel to .ltbbrac.111.rtbbrac.. Lattice parameters for the CoO and NiO films are 0.4254 and 0.4173 nm, resp., and agree with published values for the corresponding bulk oxides. The lattice parameter 0.4220 nm for the Ni0.5Co0.5O film lies between those of CoO and NiO and suggests that the mixed oxide film is compositionally homogeneous. Cross-sectional HREM images of the Ni0.5Co0.5O specimen show .SIGMA.3(1.hivin.1w) twin boundaries **perpendicular** to the oxide-substrate interface. The twin regions are .apprx.30 nm in size and are uniformly distributed throughout the film. The epitaxial **orientation** of the monoxide **films** with respect to the substrate are given.

L15 ANSWER 55 OF 80 HCAPLUS COPYRIGHT 2002 ACS

AN 1991:595526 HCAPLUS
DN 115:195526
TI Superconducting properties of yttrium barium copper oxide (YBa2Cu3O7-x) thin films by plasma enhanced metal organic chemical vapor deposition
AU Chern, C. S.; Zhao, J.; Li, Y. Q.; Du, H.; Norris, P.; Kear, B.; Gallois, B.
CS EMCORE Corp., Somerset, NJ, 08873, USA
SO Sci. Technol. Thin Film Supercond. 2, [Proc. Conf.], 2nd (1990), 359-66. Editor(s): McConnell, Robert D.; Noufi, Rommel. Publisher: Plenum, New York, N. Y.
CODEN: 57JBAQ
DT Conference
LA English
AB YBa2Cu3O7-x superconducting thin films were successfully grown on a variety of crystal substrates by plasma enhanced metal org. chem. vapor deposition (PE-MOCVD). The superconducting transition temps. of the films deposited on yttrium-stabilized zirconia (YSZ), SrTiO3, and sapphire are 86, 85, 82 K, resp. The crit. c.d. is about 2 x 104 A/cm2 at 70 K. Films deposited on different substrates have very different surface morphologies. These **films** have a strong preferred **orientation** with c-axis **perpendicular** to the substrate surface.

L15 ANSWER 56 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1991:548758 HCAPLUS
DN 115:148758
TI Magnetic properties of electrodeposited iron and cobalt films on porous **aluminum oxide** layer
AU Kim, K. H.; Kang, T.; Sohn, H. J.
CS Dep. Metall. Eng., Seoul Natl. Univ., Seoul, S. Korea
SO Han'guk Pyomyon Konghak Hoechi (1990), 23(3), 150-9
CODEN: HPKHEL
DT Journal
LA Korean
AB The magnetic properties of electrodeposited Fe and Co films on porous **Al2O3** film were examd. There exists **perpendicular** magnetic anisotropy due to the shape anisotropy. The coercivity and squareness ratio of films are strongly dependent on deposited particle diam. The effect of packing fraction on squareness ratio is appreciable. Unlike the Fe-deposited films, the magnetic properties of Co **films** are changed by preferred **orientation** because of the large crystal anisotropy const. (.apprx.10 times Fe). The Fe deposited films are more suitable for **perpendicular** magnetic recording media because **perpendicular** coercivity, squareness ratio and the ratio of **perpendicular** coercivity to horizontal ones are greater than those of Co films.

L15 ANSWER 57 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1991:547831 HCAPLUS
DN 115:147831
TI Thermal and mechanical induced stresses in superconducting yttrium barium copper oxide (YBa2Cu3Ox) coatings on fibers
AU Hsueh, C. H.; Becher, P. F.; Lackey, W. J.
CS Met. Ceram. Div., Oak Ridge Natl. Lab., Oak Ridge, TN, 37831, USA
SO J. Appl. Phys. (1991), 70(3), 1337-44
CODEN: JAPIAU; ISSN: 0021-8979
DT Journal
LA English
AB Thermal stresses induced during cooling from the fabrication temp. of a

fiber with a noncubic superconducting ceramic coating are analyzeed theor. The **coating** considered has a preferred crystallog. **orientation** such that the c axis of the coating material is **perpendicular** to the fiber surface which, in turn, results in different thermal expansion coeffs. in the radial and the tangential directions in the coating. The thermal stresses are the result of both the mismatch between the fiber and the coating, and the thermal expansion anisotropy of the coating. Stresses due to bending of the fiber/coating to form a superconducting component are also addressed. A crit. radius of curvature of bending is obtained below which segmentation of the coating is predicted.

L15 ANSWER 58 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1991:482958 HCAPLUS
DN 115:82958
TI Conductive and transparent aluminum-doped zinc oxide thin films prepared by rf magnetron sputtering
AU Chen, Yung I; Duh, Jenq Gong
CS Dep. Mater. Sci. Eng., Natl. Tsing Hua Univ., Hsinchu, Taiwan
SO Mater. Chem. Phys. (1991), 27(4), 427-39
CODEN: MCHPDR; ISSN: 0254-0584
DT Journal
LA English
AB Highly conductive ZnO thin films with **Al2O3** contents of 0-10 at.% were prepd. by rf magnetron sputtering. The resistivity of the as-deposited films varies from 3.2 .times. 104 to 1.1 .times. 102 .OMEGA.-cm dependent on different exptl. conditions. The min. transmittance in the visible region (450-800 nm) is >90%. While a 92% transmission is obsd. in a sample with a thickness of 400 nm. Transmittance of the sample with a resistivity of 1.1 .times. 10-2 .OMEGA.-cm is >86% in the visible region. All **films** have a strongly preferred **orientation** of the c-axis **perpendicular** to the target surface. A defect chem. model is proposed for the effect of **Al2O3** dopants in the ZnO film. Doping of **Al2O3** up to several at.% forms a substitutional solid soln. with excess electrons dominating the elec. condition. The introduction of more **Al2O3** results in the formation of an O interstitial, which leads to an expansion in the lattice and peak shift in the x-ray diffraction.

L15 ANSWER 59 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1991:197412 HCAPLUS
DN 114:197412
TI Dependence of crystalline **orientation** on **film** thickness in laser-ablated yttrium barium copper oxide (YBa2Cu3O7-.delta.) on lanthanum aluminate (LaAlO3)
AU Carim, A. H.; Basu, S. N.; Muenchausen, R. E.
CS Cent. Micro-Eng. Ceram., Univ. New Mexico, Albuquerque, NM, 87131, USA
SO Appl. Phys. Lett. (1991), 58(8), 871-3
CODEN: APPLAB; ISSN: 0003-6951
DT Journal
LA English
AB The microstructure of YBa2Cu3O7-.delta. thin films deposited on (001)LaAlO3 substrates by a laser ablation process has been investigated by SEM, x-ray diffraction, and cross-sectional TEM. Adjacent to the substrate, the film is entirely oriented with the c-axis **perpendicular** to the surface. At a thickness of .apprx.0.4 .mu.m, the occurrence of 90.degree. boundaries brings about a transition to grains with their c-axes parallel to the surface (aligned along the [100]

and [010] directions of the pseudocubic LaAlO3 substrate). This transition is discussed in terms of the crystal growth anisotropy and the retained strain that may ppt. the transition.

L15 ANSWER 60 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1991:33224 HCAPLUS
DN 114:33224
TI Liquid-crystal display devices with **aligning film** of alumite
IN Imanishi, Masao; Otaka, Atsushi; Hiyama, Kunio; Kawamura, Takanori
PA Yamaha Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 02208633	A2	19900820	JP 1989-29255	19890208
	JP 2764997	B2	19980611		
	US 5054889	A	19911008	US 1990-477229	19900208
PRAI	JP 1989-29255		19890208		

AB Liq.-crystal display devices in which the **aligning film** of **Al2O3** porous membrane are claimed. In the liq.-crystal display devices, liq.-crystals show **perpendicular** or tilt alignment because a part of the liq.-crystal mols. enters **Al2O3** pores to be aligned approx. **perpendicular** to the substrate, and pretilt angle can be controlled by rubbing of the **aligning film** because the **aligning** force in the direction horizontal to the substrate is enhanced, so the **aligning film** is useful for twisted nematic liq.-crystal display devices requiring low pretilt angle, super-twisted nematic liq.-crystal display devices requiring high pretilt angle, and ferroelec. liq.-crystal display devices and gives high reproducibility of stable alignment in the manuf. of large-scale displays. Al was evapd. on a glass substrate with ITO transparent electrodes and the resulting Al membrane was subjected to anodic oxidn. to form an **aligning film**, which was rubbed and made into a display cell packed with liq.-crystal compn. contg. chiral dopant, pretilt angle of the display cell was 30.degree. and reproducibility and stability of alignment were fine.

L15 ANSWER 61 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1990:603032 HCAPLUS
DN 113:203032
TI Deposition of (lead, lanthanum) (zirconium, titanium) oxide (Pb,La) (Zr,Ti)O3], barium titanate (BaTiO3), (strontium, barium) niobate [(Sr,Ba)NB2O6], barium sodium niobate (Ba2NaNb5O15), potassium titanium oxide phosphate (KTiOPO4), and beta-barium borate (beta-BaB2O4) thin films
AU Wu, A. Y.
CS Cent. High Technol. Mater., Univ. New Mexico, Albuequerque, NM, 87131, USA
SO Int. SAMPE Electron. Conf. (1990), 4(Electron. Mater.--Our Future), 722-33
CODEN: ISECE8; ISSN: 1051-1067
DT Journal
LA English
AB PLZT films were deposited on various substrates including fused silica, sapphire, Si, and GaAs by using a single-target radio frequency diode/magnetron sputtering technique. These films have the correct perovskite crystal structure and are highly-oriented with the preferred [100], [110], or [111] direction **perpendicular** to the film

surfaces. Strong electrooptic and nonlinear optical effects are obsd. in the films. A discussion of the potential uses for these films including an integrated spatial light modulator a waveguide modulator, a frequency doubler, and other nonlinear optical applications is presented. Other films which have potential for similar applications were deposited. These include BaTiO3, SBN, BNN, KTP, and beta-BBO films.

L15 ANSWER 62 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1990:432880 HCAPLUS
DN 113:32880
TI In-situ growth of superconducting yttrium barium copper oxide (YBa2Cu3Oy) films by pulsed laser deposition
AU Boyce, J. B.; Connell, G. A. N.; Fork, D. K.; Fenner, D. B.; Char, K.; Ponce, F. A.; Bridges, F.; Tramontana, J.; Viano, A. M.; et al.
CS Xerox Palo Alto Res. Cent., Palo Alto, CA, 94304, USA
SO Proc. SPIE-Int. Soc. Opt. Eng. (1990), 1187(Process. Films High Tc Supercond. Electron.), 136-47
CODEN: PSISDG; ISSN: 0277-786X
DT Journal
LA English
AB YBa2Cu3Oy thin films were deposited in-situ on several substrate materials using pulsed excimer laser deposition. On the substrates, SrTiO3, MgO, LaAlO3, and yttria-stabilized zirconia (YSZ), excellent films were obtained. These films had high superconducting transition temps. (91 K) with narrow transition widths (.apprxeq.0.5 K), metallic cond. in the normal state, low room-temp. resistivity (.apprxeq.250 .mu..OMEGA.-cm), high crit. currents (.apprxeq.3 .times. 107 A/cm2 at 4.2K), c-axis orientation **perpendicular** to the plane of the **film**, and epitaxial **alignment** with the substrate. On substrates of **Al2O3** and Si, less optimal results were obtained. The transition temps. were high (86-88 K) and metallic cond. was obtained in the normal state. However, the room-temp. and microwave surface resistivities were higher and the crit. currents were lower than for the above benchmark substrates. These diminished transport properties correlate with the imperfect alignment and epitaxy of the YBCO and substrate. For **Al2O3** substrates, a narrow substrate-temp. window was found for the best in-situ YBCO films. The poorer transport properties correlate with the lack of registry of the YBCO a-b plane with the sapphire r-plane. For Si substrates, a buffer layer is required due to high reactivity even at substrate temps. as low as 550.degree.. YSZ provides a good buffer, and the best results were obtained on clean, H-terminated surfaces rather than oxidized Si. The amt. of Y2O3 in ZrO2 was varied, and the best films were obtained with x near 0.1 where (ZrO2)1-x(Y2O3)x is cubic. Epitaxial alignment of the YBCO with the Si was achieved, but there was a substantial spread in orientations, accounting for the diminished transport properties.

L15 ANSWER 63 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1989:607091 HCAPLUS
DN 111:207091
TI Growth and characterization of high Tc superconductor films
AU Yang, C. S.; Yue, A. S.
CS Dep. Mater. Sci. Eng., Univ. California, Los Angeles, CA, 90024, USA
SO High Temp. Supercond. Compd.: Process. Relat. Prop., Proc. Symp. (1989), 407-13. Editor(s): Whang, Sung H.; DasGupta, Amit. Publisher: Miner. Met. Mater. Soc., Warrendale, Pa.
CODEN: 56REAY
DT Conference
LA English

AB Superconducting films of Y-Ba-Cu-O and Bi-Sr-Ca-Cu-O systems were grown by LPE. Without post-annealing, both YBa2Cu3Ox and Bi4Sr3Ca3Cu4Oy films grown on **Al2O3** substrates show zero resistance at 70 K. X-ray diffraction patterns of the LPE grown-**films** reveal high degrees of preferred **orientation** with their c-axes **perpendicular** to the substrates.

L15 ANSWER 64 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1989:164184 HCAPLUS
DN 110:164184
TI Properties of aluminum-doped zinc oxide thin films grown by electron beam evaporation
AU Kuroyanagi, Akio
CS Dep. Electron. Eng., Inst. Vocat. Tech. Educ., Kanagawa, 229, Japan
SO Jpn. J. Appl. Phys., Part 1 (1989), 28(2), 219-22
CODEN: JAPNDE; ISSN: 0021-4922
DT Journal
LA English
AB Highly conductive thin films of ZnO have been prepd. by conventional electron beam evapn. on glass substrates. The **Al2O3** content of 0-5 wt.% was added as dopant into ZnO to decrease resistivity. An Al-doped ZnO film with a resistivity of 1.0 .times. 10-3 .OMEGA.cm was obtained at a substrate temp. of 300.degree. with 1.0 wt.% **Al2O3** content. Transmittance of this film was >90% in the visible range with 100 nm thickness. The ZnO source material doped with **Al2O3** was evapd. efficiently by a lower electron beam power compared to the case of nondoped ZnO. The c-axis **orientation** of ZnO **films** was facilitated by the addn. of **Al2O3** and the c-axis of Al-doped ZnO films is oriented **perpendicular** to glass substrates in the substrate temp. range of 60-350.degree..

L15 ANSWER 65 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1989:126669 HCAPLUS
DN 110:126669
TI Preparation of superconducting films of bismuth strontium calcium copper oxides by in-situ melting
AU Zhu, W.; Miller, M. M.; Metcalf, P. A.; Calhoun, C. S.; Sato, H.
CS Sch. Mater. Eng., Purdue Univ., West Lafayette, IN, 47907, USA
SO Mater. Lett. (1988), 7(7-8), 247-9
CODEN: MLETDJ; ISSN: 0167-577X
DT Journal
LA English
AB Superconducting films of Bi-Sr-Ca-Cu oxides are prepd. by melting powders of the oxides on MgO and **Al2O3** substrates. Resulting **films** have a strongly preferred **orientation** with the c axis **perpendicular** to the substrates, and show Tc,onset as high as .apprxeq.110 K, and the zero-resistance temps., Tc,0, are, at most .apprxeq.78 K at present. Based on the results, this technique, although simple, seems to offer promise of producing good superconducting films.

L15 ANSWER 66 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1989:31794 HCAPLUS
DN 110:31794
TI Method for the molecular alignment of a ferroelectric smectic liquid crystal: combination of metal oxide thin film and electric field
AU Kuwahara, Michio; Kawata, Yasushi; Onnagawa, Hiroyoshi; Miyashita, Kazuo
CS Dep. Electron., Toyama Univ., Toyama, 930, Japan
SO Jpn. J. Appl. Phys., Part 1 (1988), 27(8), 1365-72
CODEN: JAPNDE

DT Journal
LA English
AB A method for mol. alignment of a ferroelec. smectic liq. crystal is reported. **Homeotropic** alignment with a small angle of pretilt was obtained by surface treatment with oblique deposition of metal oxide, such as Y2O3 or **Al2O3**. Furthermore, an elec. field was applied during the cooling period from isotropic liq. to chiral smectic phase. Uniformly pretilted alignment could be obtained by using the oblique deposition and d.c. field application. On the other hand, a twisted alignment was obtained on the obliquely deposited metal oxide film when an a.c. elec. field was applied instead of a d.c. field. Electrooptical characteristics of these cells are shown.

L15 ANSWER 67 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1987:525707 HCAPLUS
DN 107:125707
TI Manufacture of **perpendicular** magnetic recording media
IN Fukuichi, Tomohiro; Tsutsumi, Kazuhiko; Yabushita, Koji
PA Mitsubishi Electric Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 3 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 62107440	A2	19870518	JP 1985-247366	19851105

AB The title process is characterized by formation of a soft magnetic layer and a **perpendicular** magnetic layer having a major component of Co-Cr on a substrate having <0.003 .mu.m in 10-point av. surface coarseness by sputtering. Thus, an alumite surface on an Al substrate film 0.5 .mu.m thick and a Co-Cr film 02 .mu.m thick were deposited by sputtering in Ar. The degree of **perpendicular orientation** in the **film** was improved.

L15 ANSWER 68 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1986:600386 HCAPLUS
DN 105:200386
TI Fabrication and properties of double layer **perpendicular** rigid disks
AU Tsutsumi, K.; Fukuichi, T.; Yabushita, K.; Umesaki, M.; Sugahara, H.
CS Mater. Electron. Devices Lab., Mitsubishi Electr. Corp., Amagasaki, 661, Japan
SO Nippon Oyo Jiki Gakkaishi (1986), 10(2), 69-72
CODEN: NOJGD3; ISSN: 0285-0192
DT Journal
LA Japanese
AB **Perpendicular** magnetic recording is promising for the achievement of higher recording d. Magnetic and crystal **orientational** properties of double **layer** rigid disks for **perpendicular** magnetic recording were studied. Coercive force distribution of the Mo-Cu-permalloy underlayer was investigated as a function of sputtering gas pressure. At optimum Ar gas pressure, good uniformity of coercive force distribution was obtained. Even in double **layer** medium, crystal **orientation** of the Co-Cr **layer** was influenced by the characteristics and thickness of the substrate surface treatment layer. Higher recording d. was obtained with lower flying height and a thinner Co-Cr layer. The D50 recording d. of 70kFRPI was achieved for a 0.15-.mu.m-thick Co-Cr layer and a

0.3-.mu.m-thick single-pole-type head at 0.1 .mu.m flying height.

L15 ANSWER 69 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1985:212798 HCAPLUS
DN 102:212798
TI Liquid crystal color display panel
IN Kawarada, Hiroshi; Tatsumichi, Toshio; Wakahata, Yasuo; Hamanaka, Mitsuyoshi; Kajitani, Tamotsu
PA Matsushita Electric Industrial Co., Ltd. , Japan
SO U.S., 8 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4490015	A	19841225	US 1982-381909	19820525
PRAI	JP 1981-79653		19810525		

AB A pos. contrast liq. crystal color display device is described which exhibits improved response and voltage characteristics. One of the 2 electrode bearing plates for the display is subjected to tilted **perpendicular** alignment prepn. (comprising oblique vapor deposition of an oxide or fluoride compd. and treatment with a soln. of a **perpendicular** orientation agent), while the other is subjected to **perpendicular** alignment without tilt. Thus, electrode-side surface of a glass plate support was coated with a layer of SiO2 1500 .ANG. thick, rubbed with a nylon cloth .apprx.20 times in a given direction, immersed in a soln. of 0.3% octadecyltriethoxysilane in iso-PrOH for 2 min, while another support was deposited with SiO2 layer and immersed in 3% octadecyltriethoxysilane in iso-PrOH for 2 min. A display material comprising EN 26 liq. crystal compn. contg. S 1082 3.1 and D 77 1 wt.% was introduced between the plates to give a display panel.

L15 ANSWER 70 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1984:16579 HCAPLUS
DN 100:16579
TI Formation of cobalt-chromium films with **perpendicular** magnetization by a sputtering method using a facing target
AU Hoshi, Yoichi; Matsuoka, Morito; Naoe, Masahiko; Yamanaka, Shunichi
CS Fac. Eng., Tokyo Inst. Technol., Tokyo, 152, Japan
SO Denshi Tsushin Gakkai Ronbunshi, C (1983), J66-C(10), 709-16
CODEN: DTGCAY
DT Journal
LA Japanese
AB Perpendicularly magnetized Co-Cr **films** with good **orientation** were deposited at a high speed on substrates with small amts. of impact of high-energy particles by sputtering using a target facing the substrates, and the dependence of the structure and magnetic properties of the films on the deposition conditions was studied. A **film** with C-axis **orientation** and superior **perpendicular**-magnetization anisotropy is deposited on a polyimide substrate at 0.3 .mu.m/min without cooling the substrate. The **film orientation** depends on the crystallinity of the substrates and on amorphous substrate is suitable for the prepn. of a **film** with good **orientation**. The coercivity of the films strongly depends on the substrate temp. as well as the types of substrates and film thickness of the soft magnetic layer. A Co-Ta amorphous layer is useful as the soft magnetic substrate layer.

L15 ANSWER 71 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1984:10170 HCAPLUS
DN 100:10170
TI First occurrence of polylithionite from rare metal granitic pegmatites
AU Skosyreva, M. V.; Vlasova, E. V.
CS Inst. Mineral. Geokhim. Kristallo Khim. Redk. Elem., Moscow, USSR
SO Dokl. Akad. Nauk SSSR (1983), 272(3), 694-7 [Mineral.]
CODEN: DANKAS; ISSN: 0002-3264
DT Journal
LA Russian
AB Rare-metal granitic pegmatites, of the spodumene-microcline-albite paragentic type, occur in schistose amphibolites. Coarse-lamellar grains of polylithionite (PL) [12174-29-7] have SiO2 52.43-53.50, **Al2O3** 17.67-18.92, K2O 10.49-11.69, Li2O 7.37-7.67, Rb2O 1.68, Cs2O 0.68, and P 8.50-8.78 wt.%. The IR spectra of PL is characterized by strong absorption bands at 445, 450, 550, 970, 1000, and 1100 cm-1; in the PL, the valence oscillations of OH are **aligned perpendicular** to the basal **layers**. The PL have a high content of tetrahedral Al (0.38-0.43) and a low content of Si in tetrahedral coordination (3.57-3.62 formula units).

L15 ANSWER 72 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1983:566925 HCAPLUS
DN 99:166925
TI Liquid crystal orientation on inorganic surfaces
AU Uchida, T.; Ohgawara, M.; Shibata, Y.
CS Fac. Eng., Tohoku Univ., Sendai, 980, Japan
SO Mol. Cryst. Liq. Cryst. (1983), 98(1-4), 149-61
CODEN: MCLCA5; ISSN: 0026-8941
DT Journal
LA English
AB It is known empirically that some kinds of liq. crystal align **perpendicular** to inorg. flat surface such as In2O3 film. This phenomenon is due to **perpendicular** adsorption of amphiphilic impurities contained in the liq. crystal to the substrate surfaces. The adsorbabilities of various amphiphilic materials to inorg. surfaces were evaluated by using a chromatog. effect, and the correlation between the adsorbability and the liq. crystal orientation was studied. The **perpendicular** alignment of liq. crystal is induced when polarities of the amphiphilic material and substrate surface are both strong and there is evidence of a relation between the polarity and IEPS (Isoelec. Point of Solid Surface), which is a measure of basicity of the surface. This fact suggests that adsorption of the amphiphilic impurity to the surface is due to the acid-base interaction.

L15 ANSWER 73 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1983:225347 HCAPLUS
DN 98:225347
TI Liquid crystal display devices
PA Alps Electric Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 3 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 57108830	A2	19820707	JP 1980-184675	19801225

AB Mol. **orientation**-controling **films** for guest-host

effect liq. crystal display devices are composed of TiO2 layer and a layer which promotes **perpendicular** (with respect to the **film**) **orientation** of the liq. crystal mols. The display cells exhibit high contrast and good response characteristics. Thus, electrode plates are coated with NTi-10 (an org. Ti compd. soln., from Nippon Soda Kasei K.K.), heated at 500.degree., then coated with an octadecyltriethoxysilane soln., heated at 120.degree., and rubbing treated to give mol. **orientation**-controlling **films**.

L15 ANSWER 74 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1983:171772 HCAPLUS
DN 98:171772
TI **Perpendicular** magnetic recording disks
PA Hitachi, Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 3 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 57208630	A2	19821221	JP 1981-93820	19810619

AB In forming a Co-Cr thin film for **perpendicular** magnetic recording on a metal plate disk such as Al or brass, an amorphous thin film such as SiO2 or **Al2O3** is used between the substrate and the Co-Cr thin **film** to improve the c-axis **orientation** of the Co-Cr thin **film**.

L15 ANSWER 75 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1982:190364 HCAPLUS
DN 96:190364
TI Buried multiheterostructure (BMH) gallium aluminum arsenide laser
AU Okajima, Masaki; Kurihara, Haruki; Iida, Seiji; Watanabe, Yukio; Motegi, Nawoto
CS Toshiba Res. Dev. Cent., Toshiba Corp., Kawasaki, 210, Japan
SO Jpn. J. Appl. Phys., Part 1 (1982), 21(Suppl. 21-1, Proc. Conf. Solid State Devices, 13th, 1981), 353-8
CODEN: JAPNDE
DT Journal
LA English
AB Buried multi-heterostructure (BMH) laser which has a sym. sep. confinement heterostructure, was developed. Due to the structure, stable fundamental mode oscillation and nearly sym. and narrow beam divergences of 21.degree. and 25.degree. (FWHM) parallel and **perpendicular** to the junction plane, resp., were obtained. Available output power cw operation was 15 mW without facet coating and 30 mW with **Al2O3** coating. For lateral current confinement, a current blocking pn junction and a self-**aligned** anodic oxide insulating **layer** were studied. The latter provided a more reliable device process. With the structure, threshold currents as low as 15 mA were obtained for 2 .mu.m-wide stripe and 280 .mu.m-long cavity. For the second LPE growth mask, a Ga0.4Al0.6As epilayer was used, whereas dielec. masks, such as SiO2 and Si3N4, react with Al in the Ga melt.

L15 ANSWER 76 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1979:95476 HCAPLUS
DN 90:95476
TI **Film** which promotes **homeotropic orientation** of liquid crystals and a liquid crystal utilizing the film

IN Krueger, Hans; Mahlein, Hans F.; Rauscher, Walter
PA Siemens A.-G., Fed. Rep. Ger.
SO U.S., 3 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4112157	A	19780905	US 1976-686934	19760517
	DE 2330909	A1	19750109	DE 1973-2330909	19730618
	GB 1450493	A	19760922	GB 1974-20706	19740510
	IT 1014934	A	19770430	IT 1974-23825	19740611
	FR 2233644	A1	19750110	FR 1974-20514	19740613
	JP 50037453	A2	19750408	JP 1974-68797	19740618
PRAI	DE 1973-2330909		19730618		
	US 1974-479847		19740617		

AB The **homeotropic** orientation of liq. crystals in an electrooptical display device is promoted by coating at least selected areas of a surface of 1 of the carrier plates with film of a metal inorg. salt selected from MgF2, Th fluoride, ZnS, **Al2O3**, or Th oxide by vapor deposition. During the coating process the carrier plate is so positioned that the surface is oriented at an angle to the path of the vaporized salts and the vaporized salts so deposited as to give a film with columnar structure extending at an angle to the surface of the plate which is either **perpendicular** or obliquely oriented to the surface.

L15 ANSWER 77 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1973:519181 HCAPLUS
DN 79:119181
TI Kinetics of the crystallization of zinc oxide piezoelectric films on oriented substrates of .alpha.-corundum
AU Val'kov, I. G.; Bondarenko, V. S.; Ryabtsev, N. G.; Kochnev, N. I.; Palagushkin, A. N.; Sharonov, B. N.
CS Mosk. Inst. Tonkoi Khim. Tekhnol. im. Lomonosova, Moscow, USSR
SO Izv. Akad. Nauk SSSR, Neorg. Mater. (1973), 9(7), 1195-8
CODEN: IVNMAW
DT Journal
LA Russian
AB The crystn. conditions of ZnO layers on .alpha.-corundum substrates in H2 stream are examd. The kinetics of the crystn. was studied at H2 pressure equal to atm. pressure. The growing was done in a **vertical** quartz reactor heated by a sep. controlled 3-zone resistance furnace. The dependence of the growth rate on supersatn. was studied under the growth conditions of 3 deg/min of the source at const. temp. of the substrate. The surface state of the substrate has a significant effect on the supersatn. dependence of the growth rate of ZnO films. In the case of homoepitaxy, a linear dependence of the growth rate on supersatn. was obsd. The dependence of the crystn. rate on the temps. of the source zones and the substrate of various orientations was also studied. For all **orientations** of the **films**, a **layerlike** growth is obsd.; while spiral dislocations were obsd. on (0001) substrate.

L15 ANSWER 78 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1972:426350 HCAPLUS
DN 77:26350
TI Forming thin, insulating oxide films particularly for piezoelectric transducers

IN De Klerk, John
PA Westinghouse Electric Corp.
SO U.S., 11 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 3655429	A	19720411	US 1969-816486	19690416

AB The vacuum evapn. techniques for the formation of compd. thin films are described in detail. Films such as CdS and ZnS were formed by evapg. the elements sep., but simultaneously and keeping the substrate at a temp. at which neither element would deposit, but only the compd. For CdS, the temp. range was 50-200.degree.. The films were grown epitaxially on **Al2O3**, when the substrate surface was **perpendicular** to the **Al2O3** axis. Oxide films, such as ZnO, were formed by evapg. the metal in O. The combined pressures of vapor and O were <10-3 torr and the substrate was kept at -75 to -195.degree.. The effects of substrate temp., Zn vapor pressure, O pressure, and O temp. on the stoichiometry and **orientation** of the **films** is discussed. Piezoelec. transducers may be formed in highly oriented films. ZnO has the highest known electromech. coupling const.

L15 ANSWER 79 OF 80 HCAPLUS COPYRIGHT 2002 ACS
AN 1965:44675 HCAPLUS
DN 62:44675
OREF 62:7959b-f
TI Porous structures from poly(tetrafluoroethylene) resins
IN Roberts, Robert
PA E. I. du Pont de Nemours & Co.
SO 13 pp.
DT Patent
LA Unavailable
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI FR 1367819		19640724	FR	
PRAI US		19620713		

AB Porous polytetrafluoroethylene (I) films with exceptional strength, which contain 5-95% voids and have a predetd. orientation, are prepd. from a hydrostatic compn. capable of being agglomerated by coalescence under pressure. The compn. consists of filler particles which can be eliminated and which have a particle size of .gtoreq.20 .mu., porous masses of colloidal particles of I with a vol. of 5-95% of the total solid vol., and a liquid softener for the I. The filler consists of sol. particles which can be leached out, such as NaCl, Na2CO3, or borax, a vaporizable component which is volatilized after removal of the liquid lubricant, and other fillers, such as **Al2O3**, graphite, fibrous K titanate, or a synthetic resin, such as poly(Me methacrylate). This compn. in the hydrostatic state is treated by concurrent application of a compressive force and a shearing force **perpendicular** to the compressive force, the shear being distributed biaxially in the direction of the compressive force in the successive stages of the treatment, until the resulting thin **film** has the desired **orientation**. The sol. filler is then removed, creating voids. The desired orientation is described in terms of x-ray diffraction ratios A (parallel to the plane of the film) and B (at right angles to it) and should be 1-0.4:1 for A, and 0.05-0.7: 1 for B. For example, 2 vols. of fine, powd. com. I (mean av.

diam. 300 .mu.) is mixed in 10 times the vol. kerosine, and 8 vols. NaCl powder (<0.297-mm. particles) is added. The mixt. is ground at ambient temp. in a rotating cutter mill until the dimensions of the I are reduced to 10 .mu. and of the NaCl to about 200 .mu.. The lubricant is then removed in vacuo until the liquid/solid ratio is 0.3:1. The filter cake formed (thickness 1.52 mm.) is calendered into a sheet 1.14 mm. thick, the sheet is folded on itself, turned 90.degree., and again calendered, and the process repeated 6 times. The hydrostatic film is then heated slightly to remove kerosine, and fritted by heating for 15 min. at 380.degree., then air cooled. The film contracts .gtoreq.35% by vol., the relation between length and breadth remaining const., to give a biaxially oriented structure loaded with NaCl and free of voids. The NaCl particles are leached out with H2O, the sheet washed until no more salt is removed, and dried for 1 hr. at 120.degree.. Air permeability tests on the porous structure obtained show an air flow of 7.4 m.3/min./m.2 at 0.007 kg./cm.2 and 37 m.3/min./m.2 at 0.35 kg./cm.2 The fritted sheet shows a load at break of .apprx.14 kg./cm.2 in both lengthwise and crosswise directions and an elongation at break of .apprx.200%. X-ray diffraction before fritting reveals an oriented structure in which the lamella are mol. oriented with a ratio between min. and max. axial orientation of 0.85 in the plane parallel to the faces of the structure and of 0.64 in the plane normal to them. After fritting and leaching, the ratios are 0.80 and 0.63, resp.

that the films are high quality single crystal material with well defined growth plane and small in-plane and out-of-plane mosaic. Single-layer films are shown to obey the Raman selection rules of TiO SUB 2 and VO SUB 2 single crystals. The close adherence to the Raman selection rules indicates the high degree of **orientation** of the **films**, both parallel and **perpendicular** to the growth plane
?

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     FILE 'WPIX, JAPIO' ENTERED AT 13:36:47 ON 13 AUG 2002
L1       174688 S ALUMINUM OXIDE OR ALUMINIUM OXIDE OR AL2O3 OR ALUMINA TRIHYDR
L2         1113 S AL2O2 OR AL2O5 OR AL2O OR AL()O
L3        18137 S ((ALIGN? OR ORIENTAT?)(2A)(LAYER? OR FILM OR COAT####))
L4      1005562 S (PLASTIC? OR THERMOPLASTIC? OR THERMOSET? OR (RESINOUS? OR PO
L5          251 S (L1 OR L2) AND L3
L6           27 S L5 AND L4
L7           24 S L5 AND (HEMEOTROPIC? OR VERTICAL? OR PERPENDICULAR?)
L8           24 S L7 NOT L6
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L6 ANSWER 1 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 2002-257400 [30] WPIX
DNN N2002-199282 DNC C2002-076587
TI Patterning of color-changing layer of organic light emitting diode display device comprises exposing areas of layer to light and oxygen and covering unexposed areas with protective layer.
DC E23 L03 U12
IN PICHLER, K
PA (EMAG-N) EMAGIN CORP
CYC 95
PI WO 2002011209 A2 20020207 (200230)* EN 62p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
AU 2001081103 A 20020213 (200238)
ADT WO 2002011209 A2 WO 2001-US24597 20010801; AU 2001081103 A AU 2001-81103 20010801
FDT AU 2001081103 A Based on WO 200211209
PRAI US 2000-222325P 20000801
AB WO 200211209 A UPAB: 20020513
NOVELTY - Patterning a first layer including a first color-changing material comprises:

(a) exposing areas of the first layer to light and oxygen and leaving other areas unexposed; and

(b) covering unexposed areas with a protective layer. The first color-changing material in the exposed areas becomes transparent to visible light and non-photoluminescent after the exposing step.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method of fabricating an up-emitting full-color organic light emitting diode (OLED) display device by:

(i) providing a monochromatic OLED display device having bottom electrode elements (302) and a surface through which light is emitted;

(ii) depositing a first layer (309) comprising a first color-changing material (310) on at least a portion of the surface;

(iii) aligning light-absorbing area(s) of a photomask above the first layer with a first electrode element of the monochromatic OLED display device;

(iv) exposing unmasked area(s) of the first layer to light shone through the photomask in the presence of oxygen to leave a first color changing region in a first patterned **layer aligned** with the first electrode element;

(v) depositing a first protective layer (307) over the first patterned layer;

(vi) depositing a second layer (311) comprising a second color-changing material (312) on the first protective layer;

(vii) aligning light-absorbing area(s) of a photomask above the second layer with a second electrode element of the monochromatic OLED display device;

(viii) exposing unmasked area(s) of the second layer to light shone through the photomask in the presence of oxygen to leave a second color-changing region in a second patterned **layer aligned** with the second electrode element; and

(ix) depositing an encapsulation layer (307) over the second patterned layer.

At least one area of the first layer and of the second layer under

the light-absorbing area(s) of the photomask are masked. The unmasked area of the second layer overlies the first color-changing region.

USE - For patterning a layer comprising a color-changing material in the fabrication of an up-emitting full-color OLED display device having a sub-pixel size of less than 50 (preferably less than 10) mu m.

ADVANTAGE - The method patterns color-changing materials without physically removing any material from the layer. It produces photobleached areas of the color-changing material layers that do not absorb or emit light and that are transparent to visible light.

DESCRIPTION OF DRAWING(S) - The figure shows a down-emitting full color OLED display device.

Bottom electrode elements 302

Protective layer/Encapsulation layer 307

First layer 309

First color-changing material 310

Second layer 311

Second color-changing material 312

Dwg.3/18

L6 ANSWER 2 OF 27 WPIX (C) 2002 THOMSON DERWENT

AN 2001-425043 [45] WPIX

DNN N2001-315356 DNC C2001-128534

TI Preparing patterned **layer** of **aligned** carbon nanotubes on substrate for semiconductors, includes applying **polymeric material** pattern on substrate using soft lithographic technique, carbonizing or synthesizing **aligned** carbon nanotubes **layer**.

DC A35 A89 E12 E36 L03 U11 U12

IN DAI, L; HUANG, S; MAU, A

PA (CSIR) COMMONWEALTH SCI & IND RES ORG

CYC 94

PI WO 2001021863 A1 20010329 (200145)* EN 26p

RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TZ UG ZW

W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

AU 2000076340 A 20010424 (200145)

ADT WO 2001021863 A1 WO 2000-AU1180 20000922; AU 2000076340 A AU 2000-76340 20000922

FDT AU 2000076340 A Based on WO 200121863

PRAI AU 1999-3041 19990923

AB WO 200121863 A UPAB: 20010813

NOVELTY - Preparing a patterned **layer** of **aligned** carbon nanotubes on a substrates using a soft lithographic technique.

DETAILED DESCRIPTION - Preparing a patterned **layer** of **aligned** carbon nanotubes on a substrate including:

(a) applying a pattern of **polymeric material** on the surface of a substrate capable of supporting nanotube capable of supporting nanotube growth using a soft lithographic technique;

(b) subjecting the **polymeric material** to carbonization to form a patterned layer of carbonized polymer on the surface of the substrate; or

(c) synthesizing a **layer** of **aligned** carbon nanotubes on regions of the substrate to which carbonized polymer is not attached to provide a patterned **layer** of **aligned** carbon nanotubes on the substrate.

INDEPENDENT CLAIMS are also included for:

(1) a patterned carbon nanotube film prepared using the claimed method;

(2) a device comprising a patterned carbon nanotube film prepared by the claimed method; and

(3) a photovoltaic cell comprising a patterned carbon nanotube film prepared by the claimed method.

USE - Used for photonic and electronic devices for use as electron field emitters in panel displays, single molecular transistors, scanning probe microscope tips, gas electrochemical energy storages, catalyst and proteins/DNA supports, artificial actuators, chemical sensors, molecular filtration membranes, energy absorbing materials, semiconductors, molecular transistors and other opto-electronic devices.

ADVANTAGE - Allows resolutions up to a sub-micrometer scale.

DESCRIPTION OF DRAWING(S) - Figure 2 is a schematic showing the stages involved in the preparation of a pattern **layer** of **aligned** carbon nanotubes.

Dwg.2/6

L6 ANSWER 3 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 2001-210579 [21] WPIX
DNN N2001-150438 DNC C2001-062459
TI Formation of electroplated high aspect ratio nanofilament or nanocone field emission device for e.g., flat panel displays, involves utilizing hard mask layer for the formation of gate and dielectric via.
DC L03 M11 U11 U12 V05
IN CONTOLINI, R J; MORSE, J D
PA (REGC) UNIV CALIFORNIA
CYC 1
PI US 6193870 B1 20010227 (200121)* 7p
ADT US 6193870 B1 US 1997-847085 19970501
PRAI US 1997-847085 19970501
AB US 6193870 B UPAB: 20010418

NOVELTY - An electroplated high aspect ratio nanofilament or nanocone field emission device is formed by utilizing a hard mask layer for the formation of gate and dielectric via.

DETAILED DESCRIPTION - Formation of a high aspect ratio, electroplated nanofilament or nanocone structure device comprises (a) providing a structure having a conductive or resistive layer (11), a dielectric layer (12), a gate material layer (13), a hard mask layer (14), and a mask layer; (b) forming at least one via (19, 20, 21,) in the mask layer, in the hard mask layer, and in the gate material layer by highly directional, selective plasma etching; (c) removing the mask material layer; (d) forming at least one via in the dielectric material **layer aligned** with the via in the gate material layer and the hard mask layer by highly directional selective plasma etching; (d) forming an emitter structure in the via or the dielectric and gate material layers; (e) removing dielectric material adjacent to the emitter structure (23); (f) removing the hard mask layer; (g) configuring the emitter structure so as not to extend above the gate material layer; and (g) forming a tip (24) on the emitter structure to define a nanofilament or nanocone emitter having a pointed tip located in the center of the via in the gate material layer.

USE - In field emission flat panel displays and/or vacuum microelectronics.

ADVANTAGE - The invention enables more tolerance in the gate via etch and dielectric cavity etch than prior processes. It also produces high efficiency field emitters, which are uniform in height and sharpness. The use of hard mask layer eliminates any erosion of the gate layer during the dielectric via etch, and protects the gate layer while the gate structure

is etched back from the edge of the dielectric via.

DESCRIPTION OF DRAWING(S) - The figures show a partially and a completed structure of nanofilament or nanocone device.

Conductive or resistive layer 11
Dielectric layer 12
Gate material layer 13
Hard mask layer 14
Via 19, 20, 21,
Emitter structure 23
Tip 24
Dwg.4, 5/5

L6 ANSWER 4 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 2001-168322 [17] WPIX
DNN N2001-121412 DNC C2001-050188
TI Solid base polymer for polymer electrolyte of lithium ion battery, comprises hybrid copolymer solid-solution homogeneous blend of at least two polymers, one having pronounced solvent retention properties.
DC A14 A17 A28 A85 E12 E34 L03 X16
IN MUNSHI, M Z A
PA (LITH-N) LITHIUM POWER TECHNOLOGIES INC
CYC 31
PI WO 2001001507 A1 20010104 (200117)* EN 43p
RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
W: AU BR CA CN ID IL IN JP KR MX SG VN
AU 2000058731 A 20010131 (200124)
US 6413676 B1 20020702 (200248)
ADT WO 2001001507 A1 WO 2000-US16294 20000626; AU 2000058731 A AU 2000-58731 20000626; US 6413676 B1 US 1999-340944 19990628
FDT AU 2000058731 A Based on WO 200101507
PRAI US 1999-340944 19990628
AB WO 200101507 A UPAB: 20010328

NOVELTY - The polymer comprises a hybrid copolymer solid-solution homogeneous blend of at least two polymers. One polymer is selected from a polar group having pronounced solvent retention properties. The other polymer is selected from at least one of polyester, polypropylene, polyethylene naphthalate, polycarbonate, polyphenylene sulfide and polytetrafluoroethylene.

DETAILED DESCRIPTION - A solid base polymer for a polymer electrolyte of a lithium ion battery comprises a hybrid copolymer solid-solution homogeneous blend of at least two polymers. One of the polymers is selected from a polar group having pronounced solvent retention properties. The other polymer is selected from at least one of polyester, polypropylene, polyethylene naphthalate, polycarbonate, polyphenylene sulfide and polytetrafluoroethylene. The second polymer has a concentration in the solid-solution blend according to at least one desired property of the base polymer.

INDEPENDENT CLAIMS are also included for:

(I) a method for preparing a solid base polymer as above, which comprises homogeneously mixing the polymers together to form a melt cast film, and then biaxially orienting the film in machine direction orientation and transverse direction orientation by respective stretching of the film to a desired final thickness;

(II) an electrolyte retaining base polymer for a lithium ion battery which comprises a thin film, as above, cast from a solution of polypropylene, polyvinylidene fluoride and acrylate monomer/oligomer, and a liquid electrolyte solution containing a lithium salt absorbed within the film;

(III) a process for forming the base polymer in (II), which

comprises:

(i) dissolving the above polymers in a solvent;

(ii) casting the solution to form a thin film, including evaporating the solvent from the solution;

(iii) soaking the thin film in the electrolyte solution to absorb it; and

(iv) curing the acrylate monomer/oligomer;

(IV) a process for forming a base polymer similar to that described above in (II) and (III), except that there is no acrylate monomer/oligomer, but instead 0.1-30 wt.% of a high surface area inorganic filler selected from fumed silica or **alumina**, is dispersed in a polypropylene and polyvinylidene fluoride blend to create porosity and enhance mechanical stability, before soaking in the liquid solvent electrolyte;

(V) a lithium ion battery which comprises:

(i) a resilient flexible polymer electrolyte film as formed in (IV); and

(ii) a pair of spaced flexible thin film electrodes, each having a polymer substrate with an electrically conductive layer on it, formed around the polymer electrolyte film;

(VI) a lithium ion battery electrode having an ultrathin film metal substrate of thickness 1-10 micro m, for a cathode or anode;

(VII) a lithium ion battery polymer substrate comprising a polymer layer with a low resistance metallization layer of conductivity 0.01-1 Ohm /square on one side;

(VIII) a method of fabricating a thin film lithium ion secondary battery, which comprises incorporating the polymer substrate of (VII), where the polymer layer is 0.5-50 micro m thick, with the above electrode structures of (VI) having thicknesses less than 5 and 10 micro m respectively; and

(IX) a method of coating an ultrathin film metallized polymer substrate with very thin film active anode and cathode materials, by evaporating the respective materials directly onto opposite sides of the substrate.

USE - For high energy density lithium ion secondary batteries, used in portable electronics and electrically powered vehicles.

ADVANTAGE - The base polymer is insoluble in organic solvents currently used in lithium ion batteries, is highly stable with temperature, exhibits little or no swelling and is mechanically strong when in contact with organic solvents compared to PVDF, is predominantly amorphous, and is ionically conductive and more conductive at lower solvents levels. The solvent is immobilized, allowing batteries to be used in any orientation. It can be used in very thin films, provides low resistance and has excellent flexibility. The battery has improved energy density, power density, higher capacity utilization, higher cycle life, greater charge/discharge efficiencies, lower polarization, greater safety and greater reliability, and can be produced at high speed, lower cost and with improved form factors.

Dwg.0/1

L6 ANSWER 5 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 2001-102322 [11] WPIX
DNN N2001-076001 DNC C2001-029830
TI New photolithographic process for preparing patterned **layer** of **aligned** carbon nanotubes comprises forming carbon nanotubes on a photoresist material applied onto a substrate and electromagnetically radiating the material.
DC A18 A21 A26 A85 E19 G06 J01 J04 J06 L03 U11 U12
IN DAI, L; HE, H Z; HUANG, S; MAU, A; YANG, Y Y

PA (CSIR) COMMONWEALTH SCI & IND RES ORG
CYC 94
PI WO 2000073203 A1 20001207 (200111)* EN 26p
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
AU 2000045283 A 20001218 (200118)
EP 1200341 A1 20020502 (200236) EN
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
ADT WO 2000073203 A1 WO 2000-AU549 20000525; AU 2000045283 A AU 2000-45283 20000525; EP 1200341 A1 EP 2000-926580 20000525, WO 2000-AU549 20000525
FDT AU 2000045283 A Based on WO 200073203; EP 1200341 A1 Based on WO 200073203
PRAI AU 1999-649 19990528
AB WO 200073203 A UPAB: 20010224
NOVELTY - Preparing a patterned **layer** of **aligned** carbon nanotubes on a substrate comprises applying a layer of photoresist (1) to the substrate, suitably masking the layer, subjecting the unmasked portion of (1) to electromagnetic radiation, developing (1) with a solvent to dissolve either transformed or untransformed portion and synthesizing the layer of carbon nanotubes on the remaining portion of (1).

DETAILED DESCRIPTION - Preparing a patterned **layer** of **aligned** carbon nanotubes on a substrate comprises:

(a) applying a layer of photoresist (1) to at least a portion of a surface of the substrate capable of supporting the nanotube growth;

(b) masking a region of the layer of (1) to provide a masked and unmasked portions;

(c) subjecting the unmasked portion of (1) to an electromagnetic radiation having a wavelength and intensity to transform the unmasked portion, while leaving the masked portion untransformed. The transformed portion exhibits solubility characteristics different then that of the untransformed portion;

(d) developing the layer of (1) by contacting with a solvent for a time and under conditions to dissolve either the transformed or untransformed portions of (1) and leave the other portion attached to the substrate; and

(e) synthesizing the patterned **layer** of **aligned** carbon nanotubes on the regions of the substrate to which the remaining portion of (1) is not attached.

INDEPENDENT CLAIMS are also included for:

(1) patterned carbon nanotubes film prepared by the process; and

(2) a device comprising the patterned carbon nanotube film.

USE - Useful in electron emitters in panel displays, field-emission transistors, single-molecular transistors, electrodes for photovoltaic cells and light emitting diodes with region-specific characteristics, optoelectronic elements, bismuth actuators, chemical and biological sensors with region-specific characteristic, molecular filtration membranes, region-specific energy absorbing materials, gas and electrochemical energy storage and catalyst and proteins/DNA supports.

ADVANTAGE - The process is easy to perform and provides a convenient route to patterned aligned carbon nanotubes with controllable geometries. The process allows formation of carbon nanotubes on various substrates with a micrometer or submicrometer resolution.

Dwg.0/4

L6 ANSWER 6 OF 27 WPIX (C) 2002 THOMSON DERWENT

AN 2000-571943 [53] WPIX
DNC C2000-170428
TI Fiber-reinforced, hot-pressed molding, is made from planar textile including common low-melting **thermoplastic** fibers and temperature-resistant reinforcing fibers in diverse materials including **plastics**, ceramics and natural products.
DC A18 A28 A32 A95 F07
IN HINTERMANN, M
PA (SWAL) ALUSUISSE TECHNOLOGY & MANAGEMENT AG; (ALCN) ALCAN TECHNOLOGY & MANAGEMENT AG
CYC 23
PI WO 2000048824 A1 20000824 (200053)* DE 16p
RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
W: AU CA JP US
AU 2000022939 A 20000904 (200103)
EP 1154893 A1 20011121 (200176) DE
R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
ADT WO 2000048824 A1 WO 2000-EP648 20000128; AU 2000022939 A AU 2000-22939 20000128; EP 1154893 A1 EP 2000-901601 20000128, WO 2000-EP648 20000128
FDT AU 2000022939 A Based on WO 200048824; EP 1154893 A1 Based on WO 200048824
PRAI CH 1999-300 19990217
AB WO 200048824 A UPAB: 20001023
NOVELTY - The molding is a re-set product, including a matrix. Staple fibers are converted to a **plastic** state. Directed fibers in a second material are embedded in the matrix. The softening-, melting- or decomposition point of the second material exceeds that of the first. Fiber orientation of the second material in the matrix, corresponds to the fiber orientation of the textile layer.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for the method of manufacture, essentially by controlled hot pressing in a mold. In addition a vehicle or craft is claimed, which is produced using the molding. This travels on water, road or rail. The molding is also used for static constructions or their components.

Preferred features: Mean staple fiber length of the first and second materials is 10-150 mm, preferably 75-85 mm. Natural fibers form or are included in the second material : cotton wool, wool, silk, jute, sisal, coco-fiber, flax or hemp. The temperature resistance of the second material is 5%-30% higher than that of the first (deg. C). A variety of fibrous forms is listed for the second material. The second material occupies between 40-70% and 53-59% of the product by volume, the first material comprising the remainder. The second material fiber **orientation** and **layer** thickness is modified by stretching. Further orientations and structural specifications are provided, together with volumetric compositions.

USE - To make a fiber-reinforced molding from a flat textile material resembling a fibrous prepreg in its treatment. See also claimed applications under independent claim heading. Further more specific uses are listed in the text of the disclosure.

ADVANTAGE - The text asserts that earlier sheet composites can only be formed to e.g. comparatively flat panels, or sheet structures. More structured moldings can not be produced, or else require additional forming stages. The new composite permits moldings and/or components to be produced rapidly in a single operation. Wall thicknesses, optionally variable, up to 5 mm are cited. A practical example is included. Further quantified and practical details of manufacture are provided in the disclosure.
Dwg.0/0

L6 ANSWER 7 OF 27 WPIX (C) 2002 THOMSON DERWENT

AN 1995-214624 [28] WPIX
DNN N1995-168293 DNC C1995-099316
TI Multicoloured floor covering made from laminated layers of **thermoplastic** elastomers - with upper layer having holes through which raised portions of differently coloured bottom layer extend through.
DC A32 A84 P73
IN CHEN, H
PA (CHEN-I) CHEN H
CYC 1
PI US 5422154 A 19950606 (199528)* 8p
ADT US 5422154 A US 1992-992604 19921218
PRAI US 1992-992604 19921218
AB US 5422154 A UPAB: 19950721
Multicoloured floor covering (40) has first layer (32) with a hole (34) extending through it and a second layer (36) with a raise portion (38) extending from its upper surface, the lower surface of the first layer being fused with the upper surface of the second layer and the raised portion of the second **layer** being **aligned** with and extending through the hole in the first layer.

Pref. both layers are formed of a base material which is 40-74 wt.% base copolymer, 20-35 wt.% strengthened copolymer, and 15 - 40 wt.% flexible copolymer. The layers also contain a flame retardant, esp. **aluminium oxide** soln., UV stabiliser, or an antioxidant.
The raised portion of the second layer has a flat upper surface that is level with the surface of the first layer, the raised portion forming an outer surface of the floor covering. The first and second layers are different colours.

USE - Floor covering is laminated from **thermoplastic** elastomers and is intended to be a low cost, light wt., and long lasting replacement for PVC or EVA floor coverings.

ADVANTAGE - Floor covering has the unique characteristics of vulcanised rubber combined with the processability of **thermoplastics**. It has very good elastic recovery, a higher friction-resistant coefficient than that of a conventional PVC floor covering, flame resistance, low toxicity when burning, and resistance to ageing and chemical attack.
Dwg.4/5

L6 ANSWER 8 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 1994-097607 [12] WPIX
DNC C1994-044757
TI Alkali **alumina** silicate lamina form particle - comprises aluminium and alkali metal which are thermally treated.
DC A60 E33 G01 G02 L01 L02
PA (ELED) DENKI KAGAKU KOGYO KK
CYC 1
PI JP 06048730 A 19940222 (199412)* 4p
ADT JP 06048730 A JP 1992-218696 19920727
PRAI JP 1992-218696 19920727
AB JP 06048730 A UPAB: 19940510
The principal component of the lamina form particle is aluminium and alkali metal, and its ratio of the max. dia. to the thickness of the particle is at least 3.

Aluminium contg. raw material and alkali metal melting agent are mixed. The mixt. is thermally treated to produce alkali **alumina** silicate lamina form particle.

USE/ADVANTAGE - The alkali **alumina** silicate lamina form particle is used for a pigment for resin, a printing ink, paints, glass, etc. It has excellent property as reinforcing material of **plastics**

, metals and ceramics. It has good **coating** property and **orientating** property.

In an example, Al2(SO4)3 powder and 4 times amt. of K2SO4 were mixed for 20 hrs. The mixt. was thermally treated at 1400 deg.C. The reaction prod. was added with acid and hydrothermally treated. The lamina particle obtd. was white crystal of K2Al22O34 of max. dia. 2-20 microns, thickness 0.1-1 micron (max. dia./thickness = 3-50).

Dwg.0/0

L6 ANSWER 9 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 1994-097601 [12] WPIX
DNC C1994-044751
TI Alkali alumino silicate lamina form particle - prepd. by mixing aluminium-contg. and silicon-contg. raw materials and alkali metal melting agent and heating.
DC A60 E33 G01 G02 L01 L02
PA (ELED) DENKI KAGAKU KOGYO KK
CYC 1
PI JP 06048723 A 19940222 (199412)* 4p
ADT JP 06048723 A JP 1992-218695 19920727
PRAI JP 1992-218695 19920727
AB JP 06048723 A UPAB: 19940510
The principal component of the lamina form particle is aluminium, silicon and alkali metal and its ratio of the max. dia. to the thickness of the particle is at least 3. (2) Aluminium-contg. raw material and silicon-contg. raw material (or the material contg. aluminium and silicon) and alkali metal melting agent are mixed. The mixt. is thermally treated to produce alkali alumino silicate lamina form particle.

USE/ADVANTAGE - The particle is used for a pigment for resin, a printing ink, paints, glass, etc. It is excellent as reinforcing material of **plastics**, metals and ceramics. It has good **coating** property and **orientating** property.

In an example, Al2(SO4)3 powder and SiO2 powder (20:80 by mole ratio) and 5 times amt. of K2SSO4 were mixed for 20 hrs. The mixt. was thermally treated at 1400 deg.C. The reaction prod. was added with acid and hydrothermally treated. The lamina particle obtd. was white crystal of KAlSi2O6(K2O.**Al2O3**.4SiO2) of max. dia. 5-30 microns, thickness 0.1-1.5 micron (max. dia./thickness = 10-100).

Dwg.0/0

L6 ANSWER 10 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 1992-235733 [29] WPIX
CR 1993-038421 [05]; 1993-169023 [21]; 1993-169053 [21]
DNN N1992-179485 DNC C1992-106284
TI Multilayer wiring board - consists of bonded blocks, each consisting of wiring layers interlaminated with polyimide layers.
DC A26 A85 G03 L03 U11 U14 V04
IN ISHIDA, H; HASEGAWA, S; YOKOKAWA, S; KIMBARA, K
PA (NIDE) NEC CORP; (NITL) NITTO DENKO CORP; (ISHI-I) ISHIDA H
CYC 6
PI EP 494668 A2 19920715 (199229)* EN 43p
R: DE FR GB
CA 2059020 A 19920710 (199239)
JP 04312998 A 19921104 (199251) 12p

AB EP 494668 A UPAB: 19940608
A multilayer wiring board is produced by assembling blocks in a stack. Each block consists of wiring layers interlaminated with polyimide insulating layers. The blocks are formed on a temporary substrate which is

removed after the block is adhesively bonded to the stack. Electrical connections between blocks are made by wiring projections which contact solder pools.

A multilayer wiring board consists of a base block (10), on which are adhesively bonded, stacked wiring blocks (50). Base block (10) consists of ceramic substrate (12) which carries terminal pins (14) with interconnecting wiring (16). Polyimide layers (20,26,32,38) carry signalling, interconnecting, and grounding wiring (18,22,28,34), and are produced by known photolithographic and plating means. Successive polyimide layers are built up by known varnish and cure means. Wiring is terminated on the top layer (38) in gold/tin solder pools (40). A wiring block (50) is assembled in like manner on a temporary aluminium substrate and its wiring terminates on top layer (54) as metal bumps (52). Blocks (10,50) are assembled by reversing block (50) to juxtapose top layers (54,38), so that bumps (52) contact solder pools (40).

USE/ADVANTAGE - The process is quicker and has a better yield than the prior art.

Dwg.1/27

Dwg.1/27

L6 ANSWER 11 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 1992-229355 [28] WPIX
DNC C1992-103150
TI Biaxially **orientated** polyester **film** for magnetic recording medium - having specific distribution curve of protrusion formed by particles in polyester, contains protrusions of colloidal silica.
DC A23 A85 E33 E36 L03
PA (TEIJ) TEIJIN LTD
CYC 1
PI JP 04151231 A 19920525 (199228)* 9p
JP 2528209 B2 19960828 (199639) 9p
ADT JP 04151231 A JP 1990-275221 19901016; JP 2528209 B2 JP 1990-275221 19901016
FDT JP 2528209 B2 Previous Publ. JP 04151231
PRAI JP 1990-275221 19901016
AB JP 04151231 A UPAB: 19970502
Biaxially stretched polyester film for mfg. a magnetic recording medium has (a) a distribution curve of protrusion formed by the particles contained in the polyester of

log y = (-11.4 x + 4) - (-10.0 x + 5)

(where x is a distance in microns from the ground level to the height and y is a number of protrusions by cutting the level of x microns, /mm2 within the range where x = at least 0.5 microns and y = 30 protrusions/mm2), (b) an increase in the friction coefft. (-/k) = up to 0.15 during the running of film and (c) independent protrusions = at least 80% and comprising 0.05-1.0 wt.% **Al2O3** particles having an average particle size = 0.06-0.2 microns, 0.05-2.0 wt.% colloidal silica having an average particle size of 0.1-0.3 microns and 0.01-1.0 wt.% inert inorganic particles and/or heat resistant polymer particles having an average particle size of 0.4-1.5 microns.

The polyester has an intrinsic viscosity = 0.4-0.9 as measured at 35 deg.C in o-chlorophenol. The **Al2O3** particles are pref. gamma-crystalline type having a Moh's hardness = up to 8. The colloidal SiO2 is prepd. by dialysis, electrolysis or salting out or by forming active silica sol through an ion exchanging resin tower and polyemrising the sol and pref. contains 100-3000 ppm Na. The inert inorganic particles are SiO2, CaCO3, talc, clay, kaolin, etc. The polymer particles are silicone resin, crosslinked polystyrene, crosslinked polyester, polyimide. The particles are blended into the polyester prior to or during or after

the polymerisation and during pelletisation.
ADVANTAGE - The medium has high slidability and high abrasion resistance and scratching resistance either for surface finished or incompletely finished metallic or **plastic** tape guid
Dwg.0/1

L6 ANSWER 12 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 1991-055045 [08] WPIX
DNN N1991-042578 DNC C1991-023372
TI Oriented polyester film for metal deposition, etc. - contg. gamma type **aluminium oxide** and polymer particles e.g. thermo-setting phenol.
DC A23 A85 L03 M13 T03 V01
PA (DAFO) DIAFOIL CO LTD
CYC 1
PI JP 03006238 A 19910111 (199108)* 7p
JP 2920938 B2 19990719 (199934) 7p
ADT JP 03006238 A JP 1989-140781 19890602; JP 2920938 B2 JP 1989-140781 19890602
FDT JP 2920938 B2 Previous Publ. JP 03006238
PRAI JP 1989-140781 19890602
AB JP 03006238 A UPAB: 19930928
Orientated polyester **film** contains 0.01-2 wt.% of gamma type **aluminium oxide** with mean particle size of up to 0.5 micro m. Pref. the polyester contains at least 80 mol % of ethylene terephthalate or ethylene-2,6-naphthalene-unit. The oxide is obtd. by thermally decomposing ammonium aluminium carbonate hydroxide. **Aluminium oxide** contains at least 70 wt.% of gamma type **aluminium oxide**. Other particles can be used to improve sliding property of film. As other particles, deposited particles obtd. by making alkali metal (cpd.) exist in ester exchange- or esterification-reaction of polyester opt. in presence of phosphorus cpd. to ppte. inert fine particles may be used. Also, added particles, e.g. kaolin, talc, carbon, molybdenum sulphide, etc. (14 cpds. are cited) are used. Also polymer particles with mean particle size of 0.05-5 micro m (e.g. **thermosetting** phenol-, **thermosetting** epoxy-, **thermosetting** urea- or benzoguanamine-resin, PTFE etc.) is compounded 0.01-3 wt.% to polyester film.
USE/ADVANTAGE - Used for metal deposition or magnetic recording medium, etc., because it has good wear resistance to various materials.
1/1

L6 ANSWER 13 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 1990-129016 [17] WPIX
DNN N1990-099868 DNC C1990-056843
TI Biaxially **orientated thermoplastic** resin **film** - obtd. by laminating surface of **thermoplastic** resin film with compsn. contg. thermotropic LC polymer, etc..
DC A23 A32 P73
PA (TORA) TORAY IND INC
CYC 1
PI JP 02078545 A 19900319 (199017)*
ADT JP 02078545 A JP 1988-230769 19880914
PRAI JP 1988-230769 19880914
AB JP 02078545 A UPAB: 19930928
Thermoplastic resin film is prepd. by laminating the surface(s) of **thermoplastic** resin film with a 0.01-5 micron-thick compsn. comprising mainly a thermotropic liq. crystal polymer and biaxially **orientating** the **coated film**.

The pref. **thermoplastic** resin comprises mainly ethylene terephalate ethylene 2,6-naphthalate or ethylene alpha,beta-bis (2-chlorophenoxy)ethane -4,4'-dicarboxylate. The thermotropic liq. crystal polymer is e.g. ethylene terephthalate/oxybenzoic acid copolymer or 2,6-naphthoic acid oxybenzoic acid copolymer. It contains substantially no inert particles. The **thermoplastic** resin has a thickness of 0.01-5 microns and contains 0.01-20 wt% inert particles (e.g. colloidal SiO2, alpha-**Al2O3** or organic polymer particles having a temp. showing ignition less in N2 of at least 360 deg.C.

The films are opt. blended with other polymer, an antioxidant, heat stabiliser, lubricant, U.V. absorber, seeding agent, etc. The thickness ratio of thermotropic liq. crystal polymer layer/ **thermoplastic** resin layer of 0.0006-0.2 enhances the scratching resistance. The laminated **film** is biaxially **orientated** to a draw ratio of 300-500% at a rate of 1000-50000% min.

USE/ADVANTAGE - The **thermoplastic** film puts the flexibility of **thermoplastic** resin and the rigidity and toughness of thermotropic liq. crystal polymer into practical use to provide the laminated film having high scratching resistance. @

0/0

L6 ANSWER 14 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 1990-005325 [01] WPIX
DNN N1990-004062 DNC C1990-002445
TI Liquid crystal display device - uses glass fibre or **alumina** spacers at base plate peripheries, with **plastic** interfacial spacers between the base plates.
DC L03 P81 P85 U14
PA (MITQ) MITSUBISHI DENKI KK
CYC 1
PI JP 01289915 A 19891121 (199001)* 6p
ADT JP 01289915 A JP 1988-120930 19880517
PRAI JP 1988-120930 19880517
AB JP 01289915 A UPAB: 19930928
The liquid crystal display device comprises a base plate carrying on its surface a thin film transistor (TFT) array, a counter electrode base plate and a liquid crystal intervening between these base plates. An inorganic, hard spacer material of glass fibre or **alumina** is used in the sealant (applied) at the peripheries of these base plates, and **plastic** interfacial spacers are used between the base plates, with variations in the distribution density.

ADVANTAGE - The combination of two different spacer materials ensures reliable sealing with precise control of the gap. Thus troubles in the TFT array, such as redn. in its characteristics and exposing of **orientation film** over the pixel electrodes are prevented.

4/8

L6 ANSWER 15 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 1989-291098 [40] WPIX
DNC C1989-129094
TI Purple pigment, for cosmetics - prepd. by coating gold on surface of carrier particles and surface treating by adsorbing with polymer surface treating agent.
DC A60 D21 G01
PA (MIYO-N) MIYOSHI KASEI YG
CYC 1
PI JP 01215865 A 19890829 (198940)* 4p

JP 2774971 B2 19980709 (199832) 3p
ADT JP 01215865 A JP 1988-41508 19880223; JP 2774971 B2 JP 1988-41508 19880223
FDT JP 2774971 B2 Previous Publ. JP 01215865
PRAI JP 1988-41508 19880223
AB JP 01215865 A UPAB: 19930923
Purple pigment is prepd. by coating 0.1-4 wt.% of Au on surface of carrier particles and opt. surface treating Au-**coated** particles by **orientatedly** adsorbing with surface treating agent via metal of Al, Mg, Ca, Zn, Zr or Ti.

Pref. the carrier is e.g. **Al2O3**, SnCl2, **Al2O3**, TiO2, ZnO, talc kaolin, mica, MgCO3, SiO2 beads, **plastic** beads, etc.. Its surface is opt. sensitised or oleophilically treated with SnCl2, etc. prior to coating with Au. Coating of Au is carried out by reducing HAuCl4 with reducing agent (e.g. SnCl2, organic acid, alcohol, aldehyde, etc.) and depositing Au concurrently on carrier. Au **coated** surfaces are **orientatedly** absorbed with surface treating agent (e.g. silicone oil, fatty or acrylamino-acid, lecithin, acylated peptide or oxidised low mol. wt. polyolefin via. metal.

USE/ADVANTAGE - Used for cosmetic with high stability and providing high quality colour.
0/0

L6 ANSWER 16 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 1989-153807 [21] WPIX
DNN N1989-117274 DNC C1989-067866
TI Laminated film for packaging photographic materials - comprises monoaxially oriented **thermoplastic** resin film, metal coated resin film and ethylene copolymer film.
DC A88 A89 A94 G06 P73 P83
PA (FUJF) FUJI PHOTO FILM CO LTD
CYC 3
PI JP 01093348 A 19890412 (198921)* 11p
US 4978572 A 19901218 (199102)
JP 06073939 B2 19940921 (199436) 9p
ADT JP 01093348 A JP 1987-249890 19871005; US 4978572 A US 1990-464663 19900111; JP 06073939 B2 JP 1987-249890 19871005
FDT JP 06073939 B2 Based on JP 01093348
PRAI JP 1987-249890 19871005
AB JP 01093348 A UPAB: 19930923
Laminated film comprises (A) monoaxially **orientated** **thermoplastic** resin **film** contg. 0.3-30 wt.% inorganic white pigment particles having average size = 0.01 - 50 microns, (B) an intermediated vacuum evapd. metal lined **thermoplastic** resin film and (C) ethylene copolymer film comprising at least 10 wt.% ethylenic copolymer having a m.pt. lower than (A), anti-blocking agent and an antioxidant.

Pref. resin in (A) is e.g., polyolefin, polyester, polyamide, polystyrene, polyvinyl chloride or polycarbonate. The white particles are e.g. TiO2, clay, mica, **Al2O3**, Ca silicate, Al(OH)3, CaCO3, BaSO4, etc. (B) is a **thermoplastic** resin (e.g. polypropylene, polyester, polyamide, polycarbonate or polyestyrene) coated with metal film (e.g. Al, Sn, Zn, Ni, Cu, etc.) by vacuum deposition, sputtering, ion-plating, etc. (C) comprises mainly ethylene copolymer and opt. an anti-blocking agent (e.g. SiO2, diatomaceous earth, Ca silicate, Al silicate, talc, Mg silicate, etc.) etc.

USE/ADVANTAGE - The film is useful for packaging photographic materials. It has small curling tendency, high tearing strength and high heat sealability. It assures dust-proofing and low dust formation even on violent vibration during the transportation. It has acceptable appearance

and printability.
0/0

L6 ANSWER 17 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 1987-285723 [41] WPIX
DNC C1987-121113
TI Making stacked metal or ceramic catalyst support - by X-ray deep lithography and micro-galvanic forming.
DC J04 M13 P53 P84
IN EHRFELD, W; MANER, A
PA (GESL) KERNFORSCHUNGSZENT KARLSRUHE
CYC 11
PI EP 240796 A 19871014 (198741)* DE 10p
R: AT CH FR GB IT LI NL SE
DE 3611732 A 19871015 (198742) 8p
AU 8771185 A 19871015 (198748)
JP 63012351 A 19880119 (198808)
DE 3611732 C 19880825 (198834)
EP 240796 B 19891004 (198940) DE
R: AT CH FR GB IT LI NL SE
ADT EP 240796 A EP 1987-103994 19870318; DE 3611732 A DE 1986-3611732 19860408; JP 63012351 A JP 1987-83130 19870406
PRAI DE 1986-3611732 19860408
AB EP 240796 A UPAB: 19930922
Reaction of flowing components is added by catalyst mounted on a support structure with a stable stack of assembled and pref. offset plate bodies with complex micro-structure. The structure is produced by a known process involving irradiation by X-rays of a **plastic** insert, via a mask with a pattern of transparent foils and absorbent structures. Selective etching of irradiated areas produces a relief **plastic** micro-structure used as basis for a sequence of electro-plating and deposit removal stages to produce integral micro-porous catalyst support ribs. These may project from the walls of polygonel cavities formed in the stacked bodies. Porosity is increased by thermally removing or chemically converting at least one component of a bonded disperse mixt.
ADVANTAGE - Requirements for heterogenous catalyst support are flexibly met in compact structure.
0/12

L6 ANSWER 18 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 1985-192709 [32] WPIX
DNN N1985-144458 DNC C1985-083982
TI Smectic liquid crystal element - forms optical image from laser signals.
DC A85 E12 E13 L03 P81 U11
PA (CANO) CANON KK
CYC 1
PI JP 60118793 A 19850626 (198532)* 10p
ADT JP 60118793 A JP 1983-227503 19831201
PRAI JP 1983-227503 19831201
AB JP 60118793 A UPAB: 19930925
Liq. crystal element comprises liq. crystal compsn. sealed in a cell and contg. a cpd. of formula (I) or (II) (where R1 and R2 are each opt. substd. alkyl cycloalkyl, allyl, opt. substd. aralkyl or opt. substd. aryl; Z1 and Z2 are each nonmetallic gp. required for completing opt. substd. heterocyclic ring; M(+) is cation; X(-) is anion, and n and m are each 0-1). The compsn. comprises smectic liq. crystal of positively dielectric anisotropy as disclosed in Published Jap. Patent Appln. Nos. 56150030, 5704029 and 57051779 and opt. 0.5-15 wt.% of cholestric liq. crystal. The cell comprises a pair of transparent electrodes of Sn oxide

or In/Sn oxide ot film or metallic AlCr, Ag or Ni attached to base plastes (e.g. of glass or **plastic**) and opt. attached with **orientation** controlling **film** (e.g. SiO, SiO2, **Al2O3**, polyvinyl alcohol, polyimide, etc.) for controlling the orientation to any desired state and for preventing the formation of current through the liquid crystal compsn.

USE/ADVANTAGE - The element forms optical image corresponding to signals of laser beam.

1/2

L6 ANSWER 19 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 1984-192176 [31] WPIX
DNN N1984-143551 DNC C1984-080893
TI Purificn. of **orientation film** of LCD element - by treating the film formed on substrate esp. **plastics**, with activated coal, silica gel or activated **alumina**.
DC A85 L03 P81
PA (HITA) HITACHI LTD
CYC 1
PI JP 59109027 A 19840623 (198431)* 3p
ADT JP 59109027 A JP 1982-218379 19821215
PRAI JP 1982-218379 19821215
AB JP 59109027 A UPAB: 19930925
Specifically a necessary electrode pattern is formed by forming transparent conductive electrode 11(ITO electrode) on an upper and lower substrates for polarising electrodes 9,10. After rubbing, a seal material (3) is laminated on (9,10) to form a package, then a liquid crystal material (4) is charged from a sealing port. Finally, a reflecting plate (7) is laminated on (10) thus, a display element is completed. The substrates (9,10) are of monoaxially drawn PET **film** and the **orientation film** is of polyetheramide resin. If a contaminating unstable material is contained in the material for the liquid crystal (4) electric current flowing between the upper and lower electrodes increases with time, and the rate of increase of such current is about twice that resulted by using purified **orientation film**.

For purificn. of the **orientation film**, 5 wt.% activated coal is first added to the **orientation film**, and stirred for 24 hr. at room temp., the product is filtered 20 wt.% activated **alumina**(neutral) is added, stirred for 2 hr. and filtered.

3/4

L6 ANSWER 20 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 1979-45164B [24] WPIX
TI Ceramic carrier esp. for exhaust gas purificn. catalyst - produced by firing aligned bundle of ceramic-coated fibres to simultaneously burn out fibres and sinter ceramic.
DC H06 J04 L02
PA (TOYW) TOYOTA CENT RES & DEV LAB
CYC 1
PI JP 54012486 B 19790523 (197924)*
PRAI JP 1970-126869 19701231; JP 1972-101395 19710405
AB JP 79012486 B UPAB: 19930901
Method comprises immersing fibrous or **plastic** cord (I) in aq. slurry of fine ceramic powder (II), withdrawing (I) from the slurry, drying (I), collecting a number of (I) in parallel, and burning the bundle to effect sintering of (II) and burning out of (I) at the same time to give carrier structure having a number of through-holes aligned in

parallel and divided by thin ceramic walls.

Used esp. for car emission treatment. In comparison with ceramic honeycomb structure made by laminating alternately corrugated and flat ceramic sheets, the carrier has superior mechanical strength is easy to produce and has excellent durability.

(II) is e.g. chamotte, **alumina**, silica, zirconia, etc. The space between the walls may be filled with ceramics of the same type as the walls by immersing the bundle in the slurry before sintering or aligning (I) with proper spacing before immersing in the slurry. For use in treating exhaust gas, the carrier may be reinforced by ceramic casing.

L6 ANSWER 21 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 1973-09554U [07] WPIX
TI **Plastic** tissues - air-permeable, for use as toilet tissues.
DC A14 A94 A97
PA (SANN) SANYO KOKUSAKU PULP CO LT
CYC 1
PI JP 48004640 B (197307)*
PRAI JP 1969-52187 19690703
AB JP 73004640 B UPAB: 19930831
Highly moisture-absorbing and air-permeable **plastic** film is produced by throughly mixing 100 pts. by vol. of a **thermoplastic** resin with 30-150 pts. by vol. of fine particles of porous filler material at a temp. above the m.pt. of the **thermoplastic** resin so as to uniformly disperse the filler particles throughout the resin matrix, then forming the resulted filler-loaded resin into film while imparting suitable **orientation** to the **film**. The **thermoplastic** resin to be used includes hydrophilic polymers such as PVC, PVA, copolymer of vinyl acetate with vinyl chloride, ethylene etc. The filler material typically includes talc, diatomaceous earth, **alumina**, calcium carbonate, wood or pulp dust etc. The film so formed after stretching has a number of air-permeable pores and contains a large proportion of moisture-absorbing porous filler particles, so that it will absorb water and pass air.

L6 ANSWER 22 OF 27 WPIX (C) 2002 THOMSON DERWENT
AN 1972-75255T [47] WPIX
TI Composite metal ribbon - with high tenacity filaments between thin metal sheets.
DC A32 A95 P73 Q36
PA (GENE) GENERAL ELECTRIC CO
CYC 3
PI BE 781990 A (197247)*
US 3841942 A 19741015 (197443)
CA 964179 A 19750311 (197513)
US 3936550 A 19760203 (197607)
PRAI US 1971-133207 19710412
AB BE 781990 A UPAB: 19930831
A **layer** of **aligned** high tenacity filaments with a high modulus of elasticity are adhesively bonded between two thin metal sheets, using a non-metallic adhesive which can be decomposed on heating without leaving a residue at below the m.pt. of the metal sheets and the filaments. The metal sheets and the filaments are pressed together. The metal sheet may be of Al, Ti or their alloys or similar low density metals. The filaments may be of B coated W, B coated with SiC, Sic,C, graphite or **Al2O3**. Pressing with adhesive takes place at a temp below its decompsn pt. and the external surface of the metal sheets may be covered with **plastic** film. A suitable adhesive is an acrylic resin soln in an org solvent. Structures may be formed by removing the

films, pressing together and heating to destroy the adhesive. The assembly provides a light, strong and resistant structure useful in aerospace applications.

L6 ANSWER 23 OF 27 JAPIO COPYRIGHT 2002 JPO
AN 1994-202120 JAPIO
TI PRODUCTION OF LIQUID CRYSTAL DEVICE AND INFORMATION TRANSMISSION DEVICE USING THIS DEVICE
IN WADA TAKATSUGI; KODERA YASUHITO
PA CANON INC, JP (CO 000100)
PI JP 06202120 A 19940722 Heisei
AI JP1992-359307 (JP04359307 Heisei) 19921226
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: P, Sect. No. 1817, Vol. 18, No. 557, P. 65 (19941024)
AB PURPOSE: To produce the liquid crystal device having a large pretilt angle and to improve the reliability and quality of the device by executing a heat treatment in a vacuum or inert gaseous atmosphere, thereby preventing the deterioration in the orientation regulation power imparted to an **orientation** control **film**.
CONSTITUTION: Bead spacers 16 (silica beads, **alumina** beads, etc.) having about 1.5.mu.m average grain size are sprayed onto one glass substrate 11a (11b) of glass substrates 11a, 11b and a sealing adhesive 17 which is an adhesive of an epoxy resin is formed by a screen printing method on another glass substrate 11b (11a). Two sheets of these glass substrates 11a, 11b are held to face each other at 0.1 to 3.mu.m spacing and are subjected to a heat treatment to solidify the sealing adhesive 17. The heat treatment is executed in a vacuum or inert gaseous atmosphere in such a case. As a result, the **orientation** control **film** is less deteriorated than in the case of execution of the heat treatment in the atm. and the degradation in the pretilt angle is suppressed.

L6 ANSWER 24 OF 27 JAPIO COPYRIGHT 2002 JPO
AN 1993-006512 JAPIO
TI PRODUCTION OF THIN-FILM MAGNETIC HEAD
IN HIKITA RYOEI
PA ALPS ELECTRIC CO LTD, JP (CO 001009)
PI JP 05006512 A 19930114 Heisei
AI JP1991-13510 (JP03013510 Heisei) 19910204
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: P, Sect. No. 1543, Vol. 17, No. 267, P. 160 (19930525)
AB PURPOSE: TO prevent the generation of warpage in a wafer and to substantially prevent the generation of the mis-registration of **alignment** by forming **film** parting grooves around respective chips during the process for forming thin films on the wafer.
CONSTITUTION: A film consisting of **Al2O3** is formed on one surface of the wafer 12 which is a substrate consisting of **plastic** . A lower magnetic layer, coil conductor, insulating layer, upper magnetic layer, etc., are laminated thereon by a thin film forming method using sputtering, etc., to form plural chips 16, 16, having electromagnetic conversion elements 14 and bonding pads 20, etc., in an arraying state. The warpage is generated gradually in the wafer 12 by the film stresses, etc., on continuation of the formation of these thin films but the film stresses in the transverse direction of the wafer 12 are relieved by the film parting grooves 18 formed around the respective chips 16, 16 , by which the wafer 12 is flattened. Then, the generation of the unequal coating of a resist, etc., and the mis-registration at the time of alignment is substantially prevented and the thin-film magnetic head having high accuracy is produced.

L6 ANSWER 25 OF 27 JAPIO COPYRIGHT 2002 JPO
AN 1987-225393 JAPIO
TI THERMAL TRANSFER MATERIAL
IN OSHIMA KATSUNORI; HAYASHI KENJI
PA TORAY IND INC, JP (CO 000315)
PI JP 62225393 A 19871003 Showa
AI JP1986-68493 (JP61068493 Showa) 19860328
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: M, Sect. No. 677, Vol. 12, No. 83, P. 161 (19880316)
AB PURPOSE: To obtain the transparent back surface layer for preventing sticking of a low thermal conductivity in the face direction, by providing an amorphous **aluminum oxide** thin layer on the surface not joined by a transfer ink **layer** of biaxial **orientation plastic film** substrate.
CONSTITUTION: An amorphous **aluminum oxide** thin layer is provided on the surface not joined by the transfer ink layer of the biaxial **orientation plastic film** substrate of 1-10.mu. prepared by giving a thermal transfer ink layer. Considering the balance of the performance and the cost or the like, polyester group, especially polyethylene terephthalate is preferable for the biaxial **orientation plastic film**. Non-crystalline property is required for the **aluminum oxide** from the point of view of flexibility and the easiness in inspection. That of a range of 300.ANG.-5,000.ANG. in thickness and a range of 1.50-1.64 in refraction factor to the wavelength (6,328.ANG.) of He-Ne laser light is preferable. The **aluminum oxide** thin layer is given to the back surface of the substrate, the contact part with a heat sensitive head being made heat resistant and even though large power is applied, sticking does not occur.

L6 ANSWER 26 OF 27 JAPIO COPYRIGHT 2002 JPO
AN 1985-159706 JAPIO
TI POLARIZING PLATE
IN MIYAMOTO KAZUAKI; KAWAI SHIGEMASA; KOBAYASHI HITOSHI
PA SEKISUI CHEM CO LTD, JP (CO 000217)
PI JP 60159706 A 19850821 Showa
AI JP1984-16664 (JP59016664 Showa) 19840130
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: P, Sect. No. 417, Vol. 9, No. 3341, P. 167 (19851227)
AB PURPOSE: To obtain a polarizing plate having superior heat resistance and moisture resistance by adhering a cellulose acetate film having a transparent thin film of a composition contg. SiO2, B2O3, BaO and **Al2O3** in a specified molar ratio on the surface to the surface of a polarizing film.
CONSTITUTION: A polarizing element such as iodine or Direct Blue 1 is adsorbed on a hydrophilic polymer film such as a polyvinyl alcohol film, and the film is stretched to orient the polarizing element. By the **orientation**, a polarizing **film** is formed. A transparent thin film of a composition contg. SiO2, B2O3, BaO and **Al2O3** in a molar ratio represented by the formula is formed on at least one side of a cellulose acetate film such as cellulose triacetate film by vacuum deposition or other method. The cellulose acetate film is adhered to at least one side of the polarizing film so that the oxide layer contacts with the polarizing film. Thus, the desired polarizing plate is obtd.

L6 ANSWER 27 OF 27 JAPIO COPYRIGHT 2002 JPO
AN 1984-109027 JAPIO
TI METHOD FOR PURIFYING ORIENTING FILM OF LIQUID CRYSTAL DISPLAY ELEMENT
IN ITSUKIDA NOBORU; MATSUYAMA SHIGERU; SASAKI MASARU

PA HITACHI LTD, JP (CO 000510)
PI JP 59109027 A 19840623 Showa
AI JP1982-218379 (JP57218379 Showa) 19821215
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: P, Sect. No. 308, Vol. 8, No. 2281, P. 138 (19841019)

AB PURPOSE: To improve the reliability of a liq. crystal display element having **plastic** substrates by treating cold curing orienting films with an adsorbent made of an ionic substance to remove contaminants contained in the films.
CONSTITUTION: Transparent electrodes 11 and orienting films of polyether amide resin or the like are formed on the surfaces of upper and under polarizing electrode substrates 9, 10 each having a polarizing film on a **plastic** film such as a polyethylene terephthalate **film**, and known **orientation** treatment is carried out. The substrates 9, 10 are placed opposite to each other with a sealant 3 in- between, and a liq. crystal material 4 is injected into the formed space to obtain a liq. crystal display element. In the figure, a symbol 7 is a reflecting plate. When the elemet is manufactured by said method, the orienting films are treated with an adsorbent made of an ionic substance such as activated carbons, silica gel or activated **alumina**, and the treated films are used to assemble the element. A liq. crystal display element having stability for a long term is obtd. Electric current flowing between the electrodes of the element is increased at a very low rate with the lapse of time.

L8 ANSWER 1 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 2002-178941 [23] WPIX
DNN N2002-136089 DNC C2002-055429
TI **Vertical** nano-sized transistor for semiconductor device, has carbon nanotubes in insulating layer over which gates, non-conductor film and drains are formed and sources are formed under insulating layer and nanotubes.
DC L03 U11 U12
IN CHOI, W B; LEE, J W; LEE, Y H; CHOI, W; LEE, J; LEE, Y
PA (SMSU) SAMSUNG ELECTRONICS CO LTD; (CHOI-I) CHOI W; (LEEJ-I) LEE J; (LEEY-I) LEE Y
CYC 4
PI US 2002001905 A1 20020103 (200223)* 18p
CN 1330412 A 20020109 (200229)
JP 2002110977 A 20020412 (200241) 10p
KR 2002001260 A 20020109 (200245)
ADT US 2002001905 A1 US 2001-891240 20010627; CN 1330412 A CN 2001-122021 20010622; JP 2002110977 A JP 2001-192414 20010626; KR 2002001260 A KR 2000-35703 20000627
PRAI KR 2000-35703 20000627
AB US2002001905 A UPAB: 20020411
NOVELTY - Carbon nanotubes (100) are **vertically aligned** in insulating **layer** (10) having holes (10') of nano-sized diameter. Gates (20) are formed over layer (10) in the vicinity of nanotubes. Non-conductor film (30) is deposited on the gates to fill the holes. Drains (50) are formed over the non-conductor film and carbon nanotubes. Sources (40) are formed under the insulating layer and the carbon nanotubes.
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for **vertical** nano-sized transistor manufacture.
USE - For semiconductor device.
ADVANTAGE - The transistor of a tera-bit can be formed using intrinsic characteristics of carbon nanotubes to overcome the limitations of conventional semiconductor technology. Size of transistor ranges from several tens of nanometers to 1 mu m using tera-bit scale carbon nanotubes as channels. The transistor has electrically switching characteristics and consumes low power. The nanotubes are capable of achieving high density.
DESCRIPTION OF DRAWING(S) - The figure shows the **vertical** cross-sectional view of the processing step in a method of manufacturing the **vertical** nano-sized transistor using carbon nanotubes.
Insulating film 10
Holes 10'
Gates 20
Non-conductor film 30
Sources 40
Drains 50
Carbon nanotubes 100
Dwg.3F/9

L8 ANSWER 2 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 2001-376813 [40] WPIX
DNN N2001-275815 DNC C2001-115311
TI Field emission display device includes two **films**, **vertically aligned** carbon nanotubes as emitter tips, two spacers, and upper substrate.
DC L03 V05
IN LEE, C; YOO, J; LEE, C J; YOO, J E
PA (LEEC-I) LEE C; (ILJI-N) ILJIN NANOTECH CO LTD; (LITZ-I) LI T Z; (RIJI-N)

RIJIN NANOTECH CO LTD; (LEEC-I) LEE C J

CYC 28

PI EP 1102299 A1 20010523 (200140)* EN 10p
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
JP 2001176431 A 20010629 (200141) 7p
CN 1302079 A 20010704 (200158)
KR 2001049452 A 20010615 (200171)

ADT EP 1102299 A1 EP 2000-309105 20001016; JP 2001176431 A JP 2000-321075 20001020; CN 1302079 A CN 2000-130370 20001102; KR 2001049452 A KR 2000-29581 20000531

PRAI KR 2000-29581 20000531; KR 1999-49020 19991105

AB EP 1102299 A UPAB: 20010719

NOVELTY - A field emission display device has a first metal film, as a cathode, formed on a lower substrate; **vertically** aligned carbon nanotubes as emitter tips; a first spacer formed on the first metal film; a second metal film, as a gate electrode; and an upper substrate formed on a second spacer formed on the first spacer to which a transparent electrode and a fluorescent layer are attached.

DETAILED DESCRIPTION - A field emission display device comprises a first metal film (32) for use as a cathode formed on a lower substrate (30); carbon nanotubes (34) for use as emitter tips which are **vertically** aligned on the first metal film; a first spacer (36) installed on the first metal film; a second metal film (38) shaped like a mesh to serve as a gate electrode; a second spacer (40) formed on the first spacer; and an upper substrate (50) formed on the second spacer to which a transparent electrode (52) and a fluorescent layer (54) are attached. The second metal film is supported by the first spacer and is formed on the carbon nanotubes. An INDEPENDENT CLAIM is also included for a method of manufacturing a field emission display device, comprising forming a first metal as a cathode on a lower substrate; growing **vertically**-aligned carbon nanotubes on the first metal film; installing a first spacer on the first metal film; forming on the carbon nanotubes a second metal film shaped like a mesh as a gate electrode and supported by the first space; forming a second spacer on the first spacer; and installing on the second spacer an upper substrate to which a transparent electrode and a fluorescent layer are attached.

USE - As field emission display device.

ADVANTAGE - The invention provides a simple structure, thus increasing a manufacturing yield. It can be manufactured to have a large area. It uses **vertically** well-aligned carbon nanotubes as emitter tips, thus obtaining a large emission current at a low operating voltage, e.g. at at most 3 V/ mu m. It also provides excellent luminous efficiency and high reliability since it has high-density tips per unit area.

DESCRIPTION OF DRAWING(S) - The figure shows a cross-sectional view of a field emission display device.

Lower substrate 30
First metal film 32
Carbon nanotubes 34
First spacer 36
Second metal film 38
Second spacer 40
Upper substrate 50
Transparent electrode 52
Fluorescent layer 54

Dwg.1/7

L8 ANSWER 3 OF 24 WPIX (C) 2002 THOMSON DERWENT

08/13/2002

AN 1999-289864 [25] WPIX
DNN N1999-216601
TI Magnetic tunnel junction magnetoresistive readhead for sensing magnetically recorded data.

DC T03 U12 V02
IN FONTANA JNR, R E; PARKIN, S S P; TSANG, C H; WILLIAMS, M L; FONTANA, R E
PA (IBMC) INT BUSINESS MACHINES CORP; (IBMC) IBM CORP
CYC 30
PI EP 911810 A2 19990428 (199925)* EN 20p
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
US 5901018 A 19990504 (199925)
CN 1215879 A 19990505 (199936)
JP 11213350 A 19990806 (199942) 16p
JP 3004007 B2 20000131 (200010) 16p
KR 99036636 A 19990525 (200032)
SG 87011 A1 20020319 (200234)
KR 295289 B 20011026 (200236)
ADT EP 911810 A2 EP 1998-308586 19981020; US 5901018 A US 1997-957788 19971024; CN 1215879 A CN 1998-123427 19981023; JP 11213350 A JP 1998-289013 19981012; JP 3004007 B2 JP 1998-289013 19981012; KR 99036636 A KR 1998-37935 19980915; SG 87011 A1 SG 1998-4218 19981016; KR 295289 B KR 1998-37935 19980915
FDT JP 3004007 B2 Previous Publ. JP 11213350; KR 295289 B Previous Publ. KR 99036636
PRAI US 1997-957788 19971024
AB EP 911810 A UPAB: 19990719
NOVELTY - ''Sensing'' (132) and ''fixed'' (118) ferromagnetic layers separated by, tunnel barrier layer (120) includes electrodes (102,104) formed on gap layers (G1,G2) with base electrode layer stack (110) including ferromagnetic layer (118) fixed by magnetic bias. The layers are lapped at front edge, with the sensing layer extending beyond back edges of tunnel barrier and fixed layer.

DETAILED DESCRIPTION - More electrons pass **perpendicularly** through ''free'' (sensing) and ''fixed'' ferromagnetic layers separated by, and in contact with, tunnel barrier layer, when relative polarization states of ferromagnetic **layers** are **aligned** than when misaligned.

USE - Magnetic data storage disk reader.

ADVANTAGE - Improved sensitivity. Small dimensions gives high spatial resolution and high area density.

DESCRIPTION OF DRAWING(S) - The drawing shows layer structure viewed from disk plane.

electrodes 102,104
base electrode layer stack 110
template layer 112
antiferromagnetic material layer 116
fixed ferromagnetic layer 118
tunnel barrier 120
sensing or free ferromagnetic layer. 132

Dwg.4/7

L8 ANSWER 4 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1999-256429 [22] WPIX
DNN N1999-191073
TI Magnetic tunnel junction magnetoresistive readhead for sensing magnetically recorded data.

DC T03 U12 V02
IN DILL, F H; FONTANA JNR, R E; PARKIN, S S P; TSANG, C H; FONTANA, R E

08/13/2002

PA (IBMC) INT BUSINESS MACHINES CORP; (IBMC) IBM CORP
CYC 30
PI EP 911811 A2 19990428 (199922)* EN 19p
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
US 5898548 A 19990427 (199924)
JP 11213351 A 19990806 (199942) 14p
SG 67574 A1 19990921 (199945)
CN 1223431 A 19990721 (199947)
KR 99036637 A 19990525 (200032)
KR 295288 B 20011026 (200236)
JP 3300291 B2 20020708 (200247) 14p
ADT EP 911811 A2 EP 1998-308587 19981020; US 5898548 A US 1997-957787 19971024; JP 11213351 A JP 1998-289020 19981012; SG 67574 A1 SG 1998-4212 19981015; CN 1223431 A CN 1998-119403 19980930; KR 99036637 A KR 1998-37936 19980915; KR 295288 B KR 1998-37936 19980915; JP 3300291 B2 JP 1998-289020 19981012
FDT KR 295288 B Previous Publ. KR 99036637; JP 3300291 B2 Previous Publ. JP 11213351
PRAI US 1997-957787 19971024
AB EP 911811 A UPAB: 19991122
NOVELTY - ''Sensing'' (132) and ''fixed'' (118) ferromagnetic layers separated by tunnel barrier layer (120) located in pedestal region between electrically conductive spacer layers (102,104), of optimized thickness formed on two spaced apart magnetic shields (S1,S2) also acting as electrically conducting leads, having electrode layer stack (110) including ferromagnetic layer (118) fixed by magnetic bias.
DETAILED DESCRIPTION - The layers are lapped at front edge forming coplanar sensing region. More electrons pass **perpendicularly** through ''Free'' (sensing) and ''fixed'' ferromagnetic layers separated by, and in contact with, tunnel barrier layer, when relative polarization states of ferromagnetic **layers** are **aligned** than when misaligned.
USE - Magnetic data storage disk reader.
ADVANTAGE - Improved sensitivity. Small dimensions gives high spatial resolution and high area density. Detects individual magnetic transitions without interference from neighbors.
DESCRIPTION OF DRAWING(S) - The drawing shows layer structure viewed from disk plane.
electrically conductive spacer layers 102,104
base electrode layer stack 110
template layer 112
antiferromagnetic material layer 116
fixed ferromagnetic layer 118
tunnel barrier 120
sensing or free ferromagnetic layer 132
magnetic shields. S1,S2
Dwg.4A/6

L8 ANSWER 5 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1999-204189 [17] WPIX
CR 2001-440071 [25]
DNN N1999-150392
TI Hybrid aligned liquid crystal display (LCD).
DC P81 U11 U14
IN DROLET, J P; PSALTIS, D; SCHERER, A
PA (CALY) CALIFORNIA INST OF TECHNOLOGY
CYC 1
PI US 5880801 A 19990309 (199917)* 11p

ADT US 5880801 A US 1996-612382 19960307
PRAI US 1996-612382 19960307
AB US 5880801 A UPAB: 20010822
NOVELTY - A porous **aluminum oxide** layer (62) on the surface of a substrate (44) has elongated pores (68) which are **perpendicular** to the substrate surface. A liquid crystal material (40) comprised of elongated molecules (66) overlies the porous layer and resides within the pores so that the molecules are homeotropically aligned.

DETAILED DESCRIPTION - The porous **aluminum oxide** layer is formed by partially anodizing an aluminum film in an acidic electrolyte so that the porous layer is formed on it. INDEPENDENT CLAIMS are included for:

(1) a method for creating homeotropic alignment,
(2) a hybrid aligned nematic cell on an integrated circuit,
(3) a method for creating a hybrid aligned nematic cell on an integrated circuit,
(4) a device having homeotropically aligned liquid crystals, and
(5) a liquid crystal display.

USE - Applications of this invention include optical information storage and processing systems, optoelectronic neuromorphic systems, displays, and electrically programmable diffractive optical elements and beam shaping devices. Devices fabricated in accordance with the invention include reflective liquid crystal-on-silicon (LCOS) spatial light modulators and smart pixel arrays capable of analog phase and amplitude modulation at low driving voltages, and electrically programmable high resolution beam steering devices.

ADVANTAGE - Allows liquid crystal devices to be fabricated on the surface of integrated circuits because of their compatibility with aluminum. Allows the use of thicker hybrid aligned nematic (HAN) cells such as 4 to 10 microns. Reduces the effect of the roughness of the substrate surface. Provides better alignment quality, contrast and light efficiency.

DESCRIPTION OF DRAWING(S) - The drawings show a cross sectional view of the behavior of the liquid crystal molecules and an exploded view the porous **aluminum oxide layer** inducing homeotropic **alignment** of the liquid crystals.

liquid crystal material 40
substrate 44
aluminum film 46,60
aluminum oxide layer 48,62
liquid crystals 66
pores 68
Dwg.1,2/5

L8 ANSWER 6 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1995-312595 [41] WPIX
DNN N1995-236223 DNC C1995-139173
TI Cone-type calix (4) resorcinarene cpds. - prepd. by reacting resorcinol with aldehyde in presence of acid catalyst, useful as surface reforming agents.

DC A60 E14 G08 L03 M22 P42
IN ICHIMURA, K; KURITA, E; UEDA, M
PA (TODA) TODA KOGYO CORP; (TODA) TODA KOGYO KK; (TOKU) TOKUYAMA SODA KK
CYC 6
PI EP 671220 A1 19950913 (199541)* EN 29p
R: DE FR GB NL
JP 07252177 A 19951003 (199548) 14p
JP 07252188 A 19951003 (199548) 9p

US 5688998 A 19971118 (199801) 17p
EP 671220 B1 19990714 (199932) EN
R: DE FR GB NL
DE 69510705 E 19990819 (199939)
JP 3226194 B2 20011105 (200172) 10p
JP 3226195 B2 20011105 (200172) 14p
ADT EP 671220 A1 EP 1995-301590 19950310; JP 07252177 A JP 1994-67757 19940311; JP 07252188 A JP 1994-67756 19940311; US 5688998 A US 1995-401499 19950310; EP 671220 B1 EP 1995-301590 19950310; DE 69510705 E DE 1995-610705 19950310, EP 1995-301590 19950310; JP 3226194 B2 JP 1994-67756 19940311; JP 3226195 B2 JP 1994-67757 19940311
FDT DE 69510705 E Based on EP 671220; JP 3226194 B2 Previous Publ. JP 07252188; JP 3226195 B2 Previous Publ. JP 07252177
PRAI JP 1994-67757 19940311; JP 1994-67756 19940311
AB EP 671220 A UPAB: 19960422
Cone-type calix (4) resorcinarene cpds. of formula (I) are new. R = 3-18C alkyl, alkenyl or aralkyl, or an opt. substd. aryl; R1 = H, 2-4C carboxyalkyl or hydroxyalkyl. Also claimed are cone-type calix (4) resorcinarene cpds. of formula (Ia). R2 = 2-4C carboxyalkyl.

USE - Surface reforming agents are used for improving and controlling properties, e.g. electric charging properties, electro-conductivity, anti-corrosiveness, hydrophilic or hydrophobic properties; for increasing the functional efficiency of composite materials by controlling the interface between materials arising from complexing; and esp. for prepn. of magnetic toners. The prods. are useful for surface reforming materials pref. having a polar surface (claimed), e.g. powders, particles and mouldings of metals (claimed), e.g. metals and alloys of Fe, Cu, Ti, Al and Ni; inorganic substances (claimed), e.g. kaolin, talc, carbon black, molybdenum sulphide, gypsum, barium sulphate, LiF,CaF2, zeolite, calcium phosphate and calcium carbonate; silicon dioxides, e.g. silica (claimed) and quartz. metal oxides (claimed), e.g. iron oxide (claimed), zinc oxide, titania, **alumina** and ferrite; composite metal oxides (claimed) composed of silicon dioxides; and resins (claimed), e.g. polyvinyl alcohol, cellulose, polyamides, polyurethanes and polyimides.

ADVANTAGE - Dense monomolecular **layers** having **perpendicular alignment** are obtd. on, e.g. quartz and polyvinyl alcohol substrates, even at low concns. and the prods. are capable of inducing rapid homeotropic alignment of liq. crystal materials in contact with the treated substrates. High levels of adsorption onto substrates are obtd. and the prods. are simply prepd. in high yields, e.g. 97%.

Dwg.0/4

L8 ANSWER 7 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1995-154846 [20] WPIX
CR 1992-063857 [08]; 1992-292354 [35]
DNN N1995-121971
TI Thin film magnetic read/write head - has pole tips which provide outside pole face contour that is different form pole tip contour along gap region, upper and lower pole tips being **aligned** using sacrificial **layer**.
DC T03 V02
IN AMIN, N; BORTINS, J; CURLAND, N; KEEL, B G; MADSEN, T; YAN, Y D
PA (SEAG-N) SEAGATE TECHNOLOGY
CYC 1
PI US 5406434 A 19950411 (199520)* 17p
ADT US 5406434 A CIP of US 1990-609921 19901106, Div ex US 1991-702956 19910520, Cont of US 1992-879874 19920507, Cont of US 1993-55922 19930429, US 1994-263009 19940620

FDT US 5406434 A CIP of US 5084957, Div ex US 5137750
PRAI US 1991-702956 19910520; US 1990-609921 19901106; US 1992-879874 19920507; US 1993-55922 19930429; US 1994-263009 19940620
AB US 5406434 A UPAB: 19950905
The magnetic head is mfd using **Al2O3** dams. The **Al2O3** dams are formed using a sacrificial layer which is deposited upon a bottom pole layer. An **Al2O3** layer is deposited over the sacrificial layer. When the sacrificial layer is removed, the **Al2O3** layer forms dams between which a top pole piece is deposited. The sacrificial layer is removed using lapping and a selected chemical etch; etch of the sacrificial layer which lifts-off overlying partial lapping or chemical etch followed by chemical **Al2O3**; depositing photoresist dams and chemically, etching the encapsulation layer and the sacrificial layer; or removal through physical or thermal shock of the **Al2O3** layer sputtered at zero bias followed by a selective chemical etch of the sacrificial layer.

The magnetic head has pole tips which provide an outside pole face contour that is significantly different from a pole tip contour along a gap region. The altered contour can be used on both top and bottom pole tips to eliminate both leading and trailing undershoots. Additionally, in shielded probe heads for **vertical** recording a gap region contour can be altered to achieve a similar reduction in leading undershoot.

ADVANTAGE - Reduces undershoot effect in read-back pulses in read-back signal.
9e,10,11/12

L8 ANSWER 8 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1994-206288 [25] WPIX
DNN N1994-162494 DNC C1994-094377
TI Oriented lithium borate thin film and prepn. - comprises the alkoxide soln. applied over monocrystalline base plate of alpha **alumina**.
DC L03 M13 U11 U14 V06
PA (TOKU) TOKUYAMA SODA KK
CYC 1
PI JP 06144996 A 19940524 (199425)* 6p
JP 3187984 B2 20010716 (200142) 6p
ADT JP 06144996 A JP 1992-299632 19921110; JP 3187984 B2 JP 1992-299632 19921110
FDT JP 3187984 B2 Previous Publ. JP 06144996
PRAI JP 1992-299632 19921110
AB JP 06144996 A UPAB: 19940810
The lithium borate thin **film** is **orientated** with its c-axis **perpendicular** to the baseplate. An alkoxide soln. consisting of lithium alkoxide (LiOR, where R stands for an alkyl), boron alkoxide (B(OR')3 where R' represents an alkyl), water, and an acid or a chelating agent, is applied over a monocrystalline baseplate of alpha **Al2O3**, and then the coated layer is crystallised by heating.

ADVANTAGE - Useful as a material for devices such as surface acoustic wave.

In an example, metal lithium (0.2766 g) was dissolved in methanol at 0-2 deg.C in a dry nitrogen gas atmosphere. At 25 deg.C 8.3128 g of B(OCH3)3 was dropped in at a rate of 10 ml/min. (SiC). The resultant soln. was stirred for three hours at 40 deg.C and then water (2.4 moles per mol. of LiOCH3) and acetic acid (0.6 mol. per mol.) were admixed. This was spin coated over an **Al2O3** baseplate and baked at 820 deg.C. The soln. yields an oriented lithium borate film.
Dwg.0/4

L8 ANSWER 9 OF 24 WPIX (C) 2002 THOMSON DERWENT

AN 1993-113733 [14] WPIX
DNN N1993-086280 DNC C1993-050776
TI Magnetic recording medium with good isotropic **orientation** - has magnetic **layer** with coercivity higher than that of magnetic powder.
DC A85 L03 T03 V02
PA (SONY) SONY CORP
CYC 1
PI JP 05054361 A 19930305 (199314)* 6p
ADT JP 05054361 A JP 1991-218709 19910829
PRAI JP 1991-218709 19910829
AB JP 05054361 A UPAB: 19931115
Medium has magnetic layer having (1) Brm/Br = 0-07, and (2) isotropic magnetic orientation, provided by passing the undried magnetic layer through **vertical** magnetic field having coercivity 0.5-1.5 times for that of the magnetic powder.

ADVANTAGE - Magnetic powder isotropic orientation is easily obtd. by a permanent magnet, so that orientation is economically obtd.

In an example, magnetic lacquer comprising 100 pts.wt. Fe acicular magnetic powder, 10 pts.wt. polyurethane resin, 10 pts.wt. vinylchloride copolymer, 6 pts.wt. **alumina**, 3 pts.wt. carbon, 4 pts.wt. hardening agent, 250 pts.wt. solvent (MEK, toluene, cyclohexanone = 2:2:1 by wt.), was coated on PET film. The coated film was passed firstly through a permanent magnet (500 Oe) and then through a **vertical** magnetic field (1.5 KOe). The magnetic layer had squarness ratio 62.9% in lengthwise direction, 62.1% in widthwise direction and 0.03 Brm/Br (isotropic orientation).

2/2
Dwg.2/2

L8 ANSWER 10 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1992-302074 [37] WPIX
CR 1993-297775 [38]; 1996-001305 [01]
DNN N1992-231075 DNC C1992-134621
TI Thin film oxide superconductor with different crystal orientation regions - has buffer and underlayers to form C-axis regions parallel and **perpendicular** to substrate.
DC L03 P73 U11 U14
IN IIYAMA, M; INADA, H
PA (SUME) SUMITOMO ELECTRIC IND CO
CYC 5
PI EP 502787 A2 19920909 (199237)* EN 10p
R: DE FR GB
CA 2062294 A 19920905 (199247)
EP 502787 A3 19930120 (199346)
US 5464812 A 19951107 (199550) 7p
EP 502787 B1 19960814 (199637) EN 7p
R: DE FR GB
DE 69212670 E 19960919 (199643)
US 5567674 A 19961022 (199648) 6p
CA 2062294 C 19970114 (199714)
ADT EP 502787 A2 EP 1992-400566 19920304; CA 2062294 A CA 1992-2062294 19920304; EP 502787 A3 EP 1992-400566 19920304; US 5464812 A Cont of US 1992-845420 19920304, US 1994-201080 19940224; EP 502787 B1 EP 1992-400566 19920304; DE 69212670 E DE 1992-612670 19920304, EP 1992-400566 19920304; US 5567674 A Cont of US 1992-845420 19920304, Div ex US 1994-201080 19940224, US 1995-472642 19950607; CA 2062294 C CA 1992-2062294 19920304
FDT DE 69212670 E Based on EP 502787; US 5567674 A Div ex US 5464812
PRAI JP 1991-62603 19910304; JP 1991-62602 19910304

AB EP 502787 A UPAB: 19960115
A thin film of oxide superconductor comprises more than two portions (10,11,12) of different crystal orientation deposited on a substrate (2), at least one being deposited on a previously deposited underlayer which facilitates crystal growth (4,31,32).

Also claimed is a film as above comprising first portions (11,12) deposited on a buffer layer (31,32) on which a superconductor with c-axis **perpendicular** to the substrate is easily grown, and second portions (10) on a second buffer layer (4) which promotes film growth with c-axis parallel to the substrate.

Further claimed is a process for preparing a thin film superconductor as above comprising depositing and removing part of the first buffer layer to expose the substrate, depositing a second buffer layer on the exposed substrate, and then depositing the superconductor.

Pref. the first buffer is LaAlPO3 or PrGaO3 and the second buffer **Al2O3** or MgO, and the buffer layers are 200 nm thick. The substrate is pref. MgO(100), SrTiO3, CdNdAlO4, or semiconductor. Pref. the underfilm layer is less than 50 nm thick, pref. the sublimable metal is Mo which is sublimed at 790 deg.C. Pref. the superconductor film is prepd. by off-axis sputtering.

USE/ADVANTAGE - A thin film oxide superconductor and process (claimed) are provided which are useful for high-performance superconducting devices or integrated superconducting circuits of high density. Regions of different crystal orientation are obtd. so that current may flow both parallel and **perpendicular** to the substrate. Perfect interfaces are obtd. and weak or contaminated junctions avoided.

lm
Dwg.1F/2
Dwg.1F/2
Dwg.1F/2

L8 ANSWER 11 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1992-036594 [05] WPIX
TI Magnetic recording medium prodn. - by coating magnetic lacquer comprising magnetic powder, binder, poly isocyanate, calendering under poly isocyanate non-reacted residual.
DC A85 G02 L03 T03
PA (TOKE) TOSHIBA KK
CYC 1
PI JP 03283019 A 19911213 (199205)*
ADT JP 03283019 A JP 1990-81126 19900330
PRAI JP 1990-81126 19900330
AB JP 03283019 A UPAB: 19931006
Prodn. comprises (1) coating, on non-magnetic substrate, magnetic lacquer comprising magnetic powder, binder, polyisocyanate, (2) drying the coated layer and (3) calendering the coated layer under 40-90% polyisocyanate non-reacted residual amt.

ADVANTAGE - Magnetic layer surface smoothness, **layer** strength, **vertical orientation** and reproducing noise are improved.

In an example, magnetic lacquer comprising 100 pts.wt. acicular metal magnetic powder, 12 pts.wt. vinyl chloride-vinylacetate copolymer resin, 8 pts.wt. polyurethane resin, 135 pts.wt. toluene, 135 pts.wt. MEK, 30 pts.wt. cyclohexanone, 5 pts.wt. **Al2O3**, 3 pts.wt. aliphatic acid ester and 4 pts.wt. polyisocyanate, was gravure coated on polyester film. The coated film was dried, calendered and slit into 1/2 inch wide magnetic tape. The magnetic tape had 0.45 friction coefft., 1.00 Rmax surface roughness, 100 surface gloss and +/- 0 output at 7 MHz in 1/2 inch tape.

08/13/2002

@(3pp Dwg.No.0/0

L8 ANSWER 12 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1992-035404 [05] WPIX
DNN N1992-026918 DNC C1992-015450
TI Magnetic recording medium prodn. - by forming magnetic lacquer by mixing magnetic powder and binder in water-organic solvent mixt., removing water, adding solvent, etc..
DC A28 A85 G02 L03 T03
PA (TOKE) TOSHIBA KK
CYC 1
PI JP 03280217 A 19911211 (199205)*
ADT JP 03280217 A JP 1990-78829 19900329
PRAI JP 1990-78829 19900329
AB JP 03280217 A UPAB: 19931006
Prodn. comprises (1) prepg. magnetic lacquer by mixing ferromagnetic powder-binder resin in water organic solvent mixt., removing water then adding solvent and (2) coating the magnetic lacquer on substrate.
ADVANTAGE - Satd. magnetisation, **vertical orientation**, magnetic **layer** surface smoothness and magnetic powder dispersion are improved.
In an example, Co, Ti, Nb-substd. Ba-ferrite 100 pts.wt., low mol.wt. polyurethane contg. -SO3Na gp. 8 pts.wt., cyclohexanone 15 pts.wt., phosphoric acid ester type surfactant 1 pt.wt., were mixed in kneader. Sepd. water was removed by decantation and the mixt. was dehydrated by pressure redn. and heating. Magnetic lacquer was obtd. by further adding 180 pts.wt. toluene-cyclohexanone (1:2), 3 pts.wt. **alumina**, 2 pts.wt. stearic acid and 3 pts.wt. polyisocyanate. The magnetic lacquer was coated on polyester film and the coated film was magnetically oriented, cured at 40 deg.C for 3 days and slit into 1/2 inch wide magnetic tape.
0/0

L8 ANSWER 13 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1991-364735 [50] WPIX
DNN N1991-279201 DNC C1991-157147
TI Producing LCD element - by forming metal film, processing film to form image electrode, oxidising surface of metal, **coating** with **vertical aligning** agent.
DC L03 P81 U14
PA (SHIH) SEIKO EPSON CORP
CYC 1
PI JP 03243918 A 19911030 (199150)*
ADT JP 03243918 A JP 1990-41945 19900222
PRAI JP 1990-41945 19900222
AB JP 03243918 A UPAB: 19930928
A LCD comprises a LC cell in which LC's are held between a pair of opposing base plates and a reflection type optical system. An image electrode is formed from a metal film acting as a reflection plate, the surface of the metal is oxidised to form a metal oxide **film**, a **vertical aligning** agent is **coated** on the film, and subjected to an aligning treatment.
USE/ADVANTAGE - Tilt alignment close to homeotropic alignment can be stabilised, and a LCD element of high reliability without change of the electro-optical characteristics in reflection type ECB mode can be obtd..
In an example, a film of 3000 Angstroms is vacuum-plated on a 1st base plate, the film is processed to form an image electrode, and the surface of the Al is anodically oxidised to form **Al2O3** film of 1000 Angstroms. Polyimide resin is applied to the film and treated for

alignment. Polyimide resin is applied onto transparent electrode on the 2nd base plate and treated for alignment. A cell of 6.0 micron in gap is formed by the base plates. A stable pretilt angle (89.0-88.0 deg.) is exhibited even after the passage of 1000 hr. at 80 deg.C.
1/4

L8 ANSWER 14 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1990-295082 [39] WPIX
DNN N1990-226768 DNC C1990-127512
TI Liq. crystal display equipment - in which orientation membrane is made of **alumina** porous membrane.
DC L03 P81 U14
PA (NIHG) YAMAHA CORP
CYC 2
PI JP 02208633 A 19900820 (199039)*
US 5054889 A 19911008 (199143)
ADT JP 02208633 A JP 1989-29255 19890208; US 5054889 A US 1990-477229 19900208
PRAI JP 1989-29255 19890208
AB JP 02208633 A UPAB: 19930928
Liq. crystal display equipment is claimed where the orien membrane is made of an **aluminium oxide** tationorous membrane. The orientation membrane is treated by rubbing treatment.
USE/ADVANTAGE - SInce the orientation membrane is made of an **aluminium oxide** porous membrane, the liq. crystal mols. a penetrate into the micro pores of the orientation membrane and **vertically** oriented to the substrate. The regenerating capacity and stability of the orientation is assured, the quality is stabilised and the prodn. is easy. The liq. crystal display equipment has a rubbing treated orintateion membrane, i.e. the liq. crystal mols. are tended to be oriented in the horizontal direction, so that the pre-tilt angle can be controlled.
1,2/2

L8 ANSWER 15 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1989-259020 [36] WPIX
DNN N1989-197372 DNC C1989-115064
TI Ferroelectric LCD - comprises baseplate, transparent electrodes, heat-resisting resin film and dielectric film.
DC A89 L03 P81 U14
PA (ULVA) ULVAC CORP
CYC 1
PI JP 01186914 A 19890726 (198936)* 5p
ADT JP 01186914 A JP 1988-9732 19880121
PRAI JP 1988-9732 19880121
AB JP 01186914 A UPAB: 19930923
The ferroelectric liq. crystal device consists of a base plate, transparent electrodes, a heat-resisting resin film, and a dielectrics film. The dielectrics film is produced by sputtering and the orientation angle of the film to the film surface changes from horizontal to **vertical**.
The base plate is pref. glass. The heat-resisting resin film is an insulating resin, e.g., polarised polyamide. The polyamide film is produced pref. by vacuum evapn. method. The dielectrics film is TiO2, **Al2O3**, SiO2, CrO2, ZrO2, Fe2O3, etc. The dielectrics film is produced by sputtering in vacuum.
USE/ADVANTAGE - Used for the prodn. of **orientated film** for ferroelectric liq. crystal device. Thin film used for heat-resisting resin **film**. The produced **orientated film** has uniform **orientation** property and high contrast.

A large sized device can be obtd.
0/0

L8 ANSWER 16 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1987-062176 [09] WPIX
DNN N1987-046964 DNC C1987-026245
TI Coating type **vertical** magnetic recording medium - has magnetic layer comprising dispersion agent of aliphatic acid and phosphoric acid ester.
DC A85 G02 L03 T03
PA (MATU) MATSUSHITA ELEC IND CO LTD
CYC 1
PI JP 62018620 A 19870127 (198709)* 4p
JP 05014330 B 19930224 (199311) 3p
ADT JP 62018620 A JP 1985-157223 19850717; JP 05014330 B JP 1985-157223 19850717
FDT JP 05014330 B Based on JP 62018620
PRAI JP 1985-157223 19850717
AB JP 62018620 A UPAB: 19930922
In an example, 100 pts.wt. Ba-ferrite magnetic powder, 250 pts.wt. solvent (MEK, toluene, cyclohexanone) dispersing agent (myristic acid 2 pts.wt., phosphoric acid ester RE610 2 pts.wt.), 9 pts.wt. vinylchloride-vinylacetate copolymer, were ball-milled for 70 hrs. Then, 21 pts.wt. polyurethane, 3 pts.wt. alpha-**Al2O3**, 6 pts.wt. carbon black, were added and milled for 30 hrs. Hardening agent (Colonate-L) was added in amt. of 10 wt.% for solid content of the binder. Obtd. magnetic lacquer was coated on 77 micron thick PET film. The coated film was calendered, heat-treated at 60 deg.C for 20 hrs. to give 4 micron thick magnetic layer. The magnetic film was punched into 3 inch dia floppy disc.
Vertical magnetic **orientation** and magnetic **layer** durability (abrasion resistance against magnetic head) are improved. Output in short wave length, running stability in floppy disc use and durability are improved.
0/0

L8 ANSWER 17 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1987-011739 [02] WPIX
DNN N1987-008588 DNC C1987-004780
TI Mfg. germanium film coated insulator baseplate - involves forming polycrystalline film and heat treating to form monocrystalline film.
DC L03 U11
PA (NIDE) NEC CORP
CYC 1
PI JP 61270293 A 19861129 (198702)* 3p
ADT JP 61270293 A JP 1985-111628 19850524
PRAI JP 1985-111628 19850524
AB JP 61270293 A UPAB: 19930922
A polycrystalline germanium film is deposited onto an amorphous insulator base-plate processed for grooves with the (100) direction predominantly in the base-plate-**vertical** direction. Then the deposited Ge film is heat-treated at a temp. lower than the melting point of Ge and a monocrystalline Ge film whose (100) direction lies in the base-plate-**vertical** direction and the grooves-longitudinal direction is formed.
In practice an amorphous insulator film 2 (SiO2 or Si3N4) is formed over a base plate 1 (Si, sapphire, **alumina** or aluminium nitride) and grooves are formed by UV-lithography and dry etching. After depositing the polycrystalline Ge film, it is monocrystallised by the heat-treatment wherein the grooves facilitate the specified

orientation. Resultant Ge **film** 3 has the (100) direction in the Z and Y directions, with a normal film thickness of, e.g. 0.5 microns.

USE/ADVANTAGE - The grapho-epitaxial method enables easy formation of monocrystalline Ge film for electronic devices.

1/1

L8 ANSWER 18 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1986-315363 [48] WPIX
CR 1981-84161D [46]; 1986-329685 [50]; 1988-068101 [10]
DNN N1986-235321 DNC C1986-136570
TI Magnetic recording medium - has magnetic layer comprising single crystal barium-ferrite magnetic powder and radiant ray-hardening modified-resin binder.
DC A85 G02 L03 T03 V02
PA (DENK) TDK CORP; (TOXW) TOKYO INK MFG CO; (TOXW) TOYO INK MFG CO
CYC 1
PI JP 61233414 A 19861017 (198648)* 12p
JP 05060171 B 19930901 (199338) 13p
ADT JP 61233414 A JP 1986-73715 19850406; JP 05060171 B Div ex JP 1980-27529 19800305, JP 1986-73715 19800305
FDT JP 05060171 B Based on JP 61233414
PRAI JP 1980-27529 19800305; JP 1986-73715 19850406
AB JP 61233414 A UPAB: 19931123
Medium has magnetic layer comprising single crystal Ba-ferrite magnetic powder and radiant ray-hardening modified resin binder. The magnetic layer is crosslinked and polymerised by irradiating radiant ray.

ADVANTAGE - Magnetic layer surface lustre, SN ratio stability and abrasion resistance are improved.

In an example, 120 pts.wt. Ba-ferrite (av. particle dia. 0.3 microns), 5 pts.wt. carbon black, 2 pts. wt. alpha-**Al2O3** powder (0.5 microns), 3 pts.wt. lecithin and 100 pts.wt. solvent (MEK: toluene = 50:50), where ball-milled for 3 hrs., to which were added 10 pts.wt. acryl double bond-introduced satd. polyester resin, 10 pts.wt. acyl double bond-introduced vinyl acetate copolymer, 10 pts.wt. acryl double bond-introduced polyether urethane elastomer, 200 pts.wt. solvent (MEK: toluene = 50:50) and 3 pts.wt. higher aliphatic acid-modified silicone oil. They were ballmilled for 42 hrs. to give magnetic lacquer, which was coated on 15 micron thick polyester film. The coated magnetic powder was **vertically orientated** and the **coated** layer was calendered and hardened by irradiating electron beam in N2 atmos.. The coated film was slitted into 1/2 inch wide video tape.
Dwg.0/0

L8 ANSWER 19 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1986-313443 [48] WPIX
DNN N1986-234123
TI Longitudinal magnetic coated recording medium - has plane magnetic particles dispersed in magnetic film on non-magnetic substrate.
DC T03
IN FUKUSHIMA, S; ITOH, K; NARUMI, T; OGAWA, S; TAKAHASHI, J
PA (FUIT) FUJITSU LTD
CYC 11
PI EP 203002 A 19861126 (198648)* EN 36p
R: DE FR GB IT NL
AU 8657593 A 19861127 (198703)
JP 61276123 A 19861206 (198703)
JP 62054829 A 19870310 (198715)
JP 62236133 A 19871016 (198747)

JP 62236139 A 19871016 (198747)
JP 62236140 A 19871016 (198747)
JP 62239318 A 19871020 (198747)
JP 62239319 A 19871020 (198747)
ES 8801459 A 19880301 (198816)
AU 8781474 A 19880317 (198819)
US 4746569 A 19880524 (198823)
ES 8900099 A 19890216 (198915)
US 4822634 A 19890418 (198918)
KR 9002990 B 19900504 (199111)
CA 1291677 C 19911105 (199151)
EP 203002 B 19920115 (199203)
R: DE FR GB IT NL
DE 3683397 G 19920227 (199210)

ADT EP 203002 A EP 1986-401026 19860513; JP 61276123 A JP 1986-79170 19860408; JP 62054829 A JP 1986-78159 19860407; JP 62236133 A JP 1986-78160 19860407; ES 8801459 A ES 1987-557721 19870915; US 4746569 A US 1986-863039 19860514; US 4822634 A US 1987-39226 19870417

PRAI JP 1985-107635 19850520; JP 1985-194076 19850903; JP 1986-78159 19860407; JP 1986-78160 19860407; JP 1986-79170 19860408; JP 1986-80064 19860409; JP 1986-80065 19860409; JP 1985-194028 19850903

AB EP 203002 A UPAB: 19930922
The medium includes plane magnetic particles (4), each having an easy magnetisation axis **perpendicular** to the major surface, dispersed in a magnetic film (7) formed on a nonmagnetic substrate (8). The orientation angle is in the range of from - 30 to f30 degrees. The orientation angle is defined an as an angle where the orientation degree, ie the ratio of residual magnetisation to saturation magnetisation, is largest, and the orientation angle is determined as the angle between the film plane and easy axis of magnetisation.

Such a medium is produced by orienting the plane magnetic particles by applying at least a magnetic field approx. in parallel to the surface of the magnetic film.

ADVANTAGE - Provides medium which dispenses with correction of output wave.

9/15

L8 ANSWER 20 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1985-022362 [04] WPIX
TI Laminated structure having high electromechanical coupling constant - comprises **alumina** substrate, thin electrode film and thin piezoelectric film.
DC L02 P73 U11 U14
PA (SUMO) SUMITOMO CHEM CO LTD
CYC 1
PI JP 59218028 A 19841208 (198504)* 6p
ADT JP 59218028 A JP 1983-91218 19830523
PRAI JP 1983-91218 19830523
AB JP 59218028 A UPAB: 19930925
Structure consists of a polycrystalline **alumina** sinter as a substrate material, thin electrode film, and a thin piezoelectric film, which are laminated in order. The polycrystalline **alumina** material is sintered with a high density to the extent that a surface wave propagation speed is substantially the same as a monocrystalline sapphire substrate, and has sufficient surface smoothness. The piezoelectric thin **film** is an **orientational** polycrystalline **film** of zinc oxide, aluminium nitride, etc. deposited by e.g. sputtering, and has its C-axis **vertically** oriented with the deposition surface.

The electrode thin film has a desired interdigitated shape.
ADVANTAGE - The new laminated structure provides high electromechanical coupling constant and a high surface wave propagation speed.
2/3

L8 ANSWER 21 OF 24 WPIX (C) 2002 THOMSON DERWENT
AN 1983-785222 [41] WPIX
DNN N1983-179955 DNC C1983-097962
TI Magnetic recording medium prodn. - using electron-beam polymerisable and hardening binder, where ferromagnetic powder is oriented by solenoid while hardening.
DC A85 G02 L03
PA (FUJF) FUJI PHOTO FILM CO LTD
CYC 1
PI JP 58146033 A 19830331 (198341)* 9p
PRAI JP 1982-28063 19820225
AB JP 58146033 A UPAB: 19930925
Process comprises coating, on a substrate, a magnetic lacquer comprising ferromagnetic fine powder and electron beam-polymerisable and hardening cpd. or the oligomer or the resin having unsatd. bond, where the ferromagnetic fine powder is orientated by air-core solenoid and the magnetic layer is simultaneously hardened by collecting electron beam in the solenoid.
Abrasion resistance (running durability) and electro-magnetic properties) ferro Abrasion resistance (running durability) and electro-magnetic properties(ferromagnetic powder orientation) are improved.
In an example, 100 pts.wt. hexagonal system ferrite (Hc 7000 Oe, ave. particle dia.= 0.2 microns) + 20 pts.wt. urethane type acrylate oligomer + 5 pts.wt. diethylene glycol diacrylate + 5 pts.wt. methyl(methacrylate + 2 pts. wt. myristic acid + 2 pts. wt. alpha-**alumina** (average particle dia.=0.5 microns) + 150 pts. wt. MEK + 50 pts.wt. cyclohexanone, were kneaded in a sand grinder. Obtd. magnetic lacquer was coated in amt. of dried thickness 5 microns on 14 microns thick PET film. The ferromagnetic fine powder in the magnetic **layer** was **perpendicularly orientated** and hardened by electron beam, while the electromagnet had power of 200 KV, 5mA, 3 Mrad. The magnetic layer was re-irradiated with electron beam of 200 KV, 10 mA, 5 Mrad.
0.0

L8 ANSWER 22 OF 24 JAPIO COPYRIGHT 2002 JPO
AN 1994-251314 JAPIO
TI MAGNETIC HEAD AND MANUFACTURE THEREOF
IN OURA KIKUO
PA NEC KANSAI LTD, JP (CO 485545)
PI JP 06251314 A 19940909 Heisei
AI JP1993-38052 (JP05038052 Heisei) 19930226
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: P, Sect. No. 1840, Vol. 18, No. 649, P. 88 (19941209)
AB PURPOSE: To obtain a core chip having excellent sliding characteristics in which a glass film containing bubbles, etc., is not exposed from a slidable contact surface of a magnetic head with a medium.
CONSTITUTION: A magnetic head is formed by opposing a pair of cores made by interposing a metal layer made of a magnetic material between nonmagnetic boards and glass fusion-bonding them to the metal layer to be integrally connected, and forming a magnetic gap at a slidable contact surface of a medium. The metal layer is covered on upper and lower ends

with SiO or **Al2O3** nonmagnetic films, and the films are exposed from the slidable contact surfaces of the medium. A method for manufacturing the head comprises the steps of covering one ends of a plurality of square rodlike nonmagnetic boards 12 with metal layers 2, and laminating its upper and lower ends with nonmagnetic films 6A, 6B. Then, the method further comprises the steps of covering a part between upper and lower nonmagnetic films on the metal layer with fusion- bonding glass **film** 11, **aligning** a plurality of nonmagnetic boards 12, butting side ends of adjacent metal layer side and nonmetal layer side, glass fusion- bonding them, then **perpendicularly** crossing it with a connecting surface, and slicing it to form core blocks.

L8 ANSWER 23 OF 24 JAPIO COPYRIGHT 2002 JPO
AN 1991-233981 JAPIO
TI SUBSTRATE FOR JOSEPHSON ELEMENT AND MANUFACTURE THEREOF
IN SUZUKI HAJIME; YAMASHITA TSUTOMU; TAKADA MASASUKE
PA RIKEN CORP, JP (CO 323642)
RES DEV CORP OF JAPAN, JP (CO 330319)
YAMASHITA TSUTOMU, JP (IN)
PI JP 03233981 A 19911017 Heisei
AI JP1990-28535 (JP02028535 Heisei) 19900209
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: E, Sect. No. 1154, Vol. 16, No. 14, P. 70 (19920114)
AB PURPOSE: To simplify a manufacturing method by bonding a single crystalline substrate to a single crystalline substrate through a bonding **layer**, **aligning** the crystal axes of the substrates, and disposing other crystal axis by deviating it at an arbitrary angle. CONSTITUTION: The surfaces of a cubic crystalline substrate 1, substrate 1 made of MgO, SrTiO3, etc., are aligned in a plane (001), and the surfaces in a plane (010) **perpendicular** to these surfaces are aligned to each other, or the surfaces in a plane (100) are aligned in a state at an arbitrary angle .theta.. In the case of aligning, Nb or **Al2O3**, etc., is deposited at least on one side surface of a blocklike single crystalline material junction surface, and a deposited layer 4 is formed with a bonding layer 5 by physically or diffusing, reacting at the time of bonding. Thus, a Josephson element can be manufactured by a simple method.

L8 ANSWER 24 OF 24 JAPIO COPYRIGHT 2002 JPO
AN 1991-046623 JAPIO
TI LIQUID CRYSTAL DISPLAY ELEMENT
IN CHINO EIJI
PA SEIKO EPSON CORP, JP (CO 000236)
PI JP 03046623 A 19910227 Heisei
AI JP1989-181977 (JP01181977 Heisei) 19890714
SO PATENT ABSTRACTS OF JAPAN, Unexamined Applications, Section: P, Sect. No. 1203, Vol. 15, No. 196, P. 56 (19910521)
AB PURPOSE: To obtain the tilt orientation approximate to a homeotropic orientation by depositing a metal oxide by oblique vapor deposition on at least either of 1st and 2nd substrates, then applying an orienting agent consisting of a mixture composed of a Ti compd. and Cr compd. thereon and subjecting the **coating** to an **orientation** treatment. CONSTITUTION: After the metal oxide 8 is deposited by oblique vapor deposition on at least either of the 1st and 2nd substrates 5, 6, the orienting agent 9 consisting of the mixture composed of the Ti compd. and the Cr compd. is applied thereon and the coating is subjected to the orientation treatment. MgF2, **Al2O3**, Sm2O3, SiO, CeF3, SiO2, etc., are preferably used as the metal oxide 8. The incident angle of the oblique vapor deposition is 70 to 89.9.degree., more prefer ably 83 to 89.5.degree. with the direction **perpendicular** to the substrate.

The thickness of the vapor deposited film of the metal oxide 8 of this time is preferably 100 to 3,000.ANG.. The tilt orientation approximate to the homeotropic orientation which is heretofore difficult, i.e. the orientation of about 85 to 89.5.degree. pretilt angle is obtd. uniformly over a wide range.